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MAR 28 1927

Greater Interest Has Been Shown by the Members of the American Pharmaceutical Association in the Vote for Headquarters Than in Any Prior Balloting. The Next Vote Will Decide Which Two Cities Will Be Contestants in the Final Ballot for the Headquarters.

Vol. XVI, No. 3 MARCH, 1927

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTY-FIFTH ANNUAL CONVENTION—THE DIAMOND ANNIVERSARY MEETING—WILL BE HELD IN ST. LOUIS.

The 1927 Meetings of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy will also meet in St. Louis, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, see pages x, xii, xiv and xvi.

For Roster of Officers of Pharmaceutical Assoc.—State and National, see pages xvii, xx and xxi.

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STANDARDS FOR FOODS AND DRUGS.

The U. S. Pharmacopœia and the National Formulary provide the legal standards for foods and drugs, and as the U. S. P. has included a standard for whisky, brandy and alcohol the requirements proposed by the medicinal spirit act should not have required distinctive bottles nor that medicinal liquors be dispensed only in un-opened bottles (with penalties attached for non-observance). Seemingly, the action indicated lack of knowledge of the function of the U. S. Standard. Fixing the retail price on an item of this kind in the way proposed seems more or less a reflection (or a variance in judgment on a matter wherein the same question is involved, and confidence) on those who were assigned, in opposition to their wishes, to dispense alcoholic liquors. Having accepted the designation as a duty pharmacists were hardly accorded fair consideration. As elsewhere stated, the bill referred to passed in the House, but failed to pass in the Senate.

THE STAND OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The following is abstracted from a letter of Secretary E. F. Kelly of the AMERICAN PHARMACEUTICAL ASSOCIATION, under date of February 15, 1927, to Hon. Bertrand H. Snell, Chairman of the Rules Committee of the House of Representatives:

> "At its Annual Meeting in Buffalo, N. Y., in 1924, the following resolutions were adopted by the AMERICAN PHARMACEUTICAL ASSOCIATION:
>
> "'1. On general principles the A. PH. A. objects to statutory enactments which tend to interfere with the judgment of qualified physicians in the treatment of their patients whether such interference consists in a limitation of the therapeutic agents which physicians may prescribe or to the quantities which they may prescribe when such prescriptions are made in good faith.
>
> "'2. This ASSOCIATION, however, does not subscribe to the statement that only *bottled-in-bond* spirits are of the requisite purity and quality, and desires to place itself on record as approving the standards of the U. S. P. and National Formulary as the sole standards that should be relied upon in determining the quality of alcohol and alcoholic liquors for medicinal purposes.'

"Since adequate standards for the quality of medicinal spirits are legally provided this ASSOCIATION wishes to respectfully enter a protest against the requirement that pharmacists can dispense medicinal spirits only in the original bottles.

"The stand taken by the AMERICAN PHARMACEUTICAL ASSOCIATION upon the liquor question is a matter of record. The pharmacist did not seek nor did he wish to become the dispenser of liquor as medicine. When it is so dispensed upon a physician's prescription it should be regarded the same as any other substance used for the alleviation of disease and the pharmacist dispenses liquor as part and parcel of his duty in pharmaceutical service to the people of the country.

"It is also stated that the act requires that the price at which medicinal spirits are sold to the pharmacist shall be stated on the label and it appears to us that this is an unnecessary reflection upon a class of citizens who are asked to render a service in dispensing these medicinals. It would appear to us necessary only to require that the medicinal spirits dispensed shall comply with the regular standard."

JACOB DINER.
Chairman of the House of Delegates, A. Ph. A.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVI MARCH, 1927 No. 3

JACOB DINER.

The Chairman of the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION served his pharmacy apprenticeship in Dr. Doernberg's Pharmacy at Strassbourg, Alsace, and completed the Course in Pharmacy at the University in 1891; prior to that time he had studied pharmacy in Berlin and Koenigsberg.

The subject of this sketch was born in Russia; coming to Koenigsberg, Germany, he attended the gymnasium of the Altstadt and completed the courses in 1884, the youngest among the gymnasium graduates.

After completing his pharmacy studies he emigrated to the United States and settled in New York City. For about three years, Mr. Diner clerked in a drug store and then entered business on his own account at 112 Manhattan Street; later, he added another store, at 126th street and St. Nicholas Avenue.

Imbued with the association spirit, Mr. Diner became a member of New York College of Pharmacy, the Manhattan Pharmaceutical Association, the German Apothecaries' Society, the AMERICAN PHARMACEUTICAL ASSOCIATION (1906) and New York State Pharmaceutical Association. He is an Ex-President of the latter, of the N. Y. Branch, A. PH. A. and of the N. Y. Pharmaceutical Conference.

In 1909, Mr. Diner took up the study of medicine at Fordham University, School of Medicine, receiving the degree of M.D. in 1913. As a second-year student, he was appointed Assistant in Bacteriology, Instructor in Pathology and Bacteriology for the next year and, in 1913, Assistant Professor in these branches, and during the year following Professor of Clinical Diagnosis, Therapeutics and Pharmacology. In 1912, Dr. Diner was authorized to organize a College of Pharmacy for the University and, after its organization, was elected Dean. Fordham University conferred on him the honorary degree of LL.D., in 1926. Dr. Diner is a member of a number of medical societies and attending and consulting physician to several hospitals. He is also Editor of the *Transactions* of the American Therapeutic Society. The Chairman's activities in behalf of pharmacy and retail pharmacists are well and generally known and, in a way, the election as presiding officer of the House of Delegates may be considered as a recognition of his services.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

PHARMACEUTICAL RESEARCH AND THE LISTER CENTENARY.

THE approach of the centenary of the birth of Joseph Lister prompts this comment. It is seldom, if ever, true that one individual alone is responsible for any great discovery—Lister recognized in Semmelweis (1818–1865) a true forerunner in rational antiseptic treatment, and gave due credit to Pasteur's discoveries that enabled him to accomplish his great work. As the writer said in an editorial about ten years ago (JOUR. A. PH. A., April 1917)—"there is always an interdependence, and at the appointed time the individual comes forward who is competent to utilize the investigations of others and by the aid of his native or cultivated ability, energy and wisdom brings about the results that make him a hero." The foregoing reflection recalls the name of Scheele, Labarraque, Runge, Calvert, Spalding and others. Pasteur's connection with pharmacy is limited to apprentice service and as member of the Strasburg Pharmacy Faculty. (See p. 572, JOUR. A. PH. A., June 1924.)

Sir William Osler said of him: "At the middle of the last century we did not know much more of the actual causes of the great scourges of the race, the plagues, the fevers and the pestilences, than did the Greeks. Here comes in Pasteur's great work. Before him Egyptian darkness; with his advent a light that brightens more and more as the years give us ever fuller knowledge." It was a study of the processes of fermentation that led Pasteur to the sure ground on which we now stand. In the annotated list of persons included in "Pasteur—The History of a Mind," by Duclaux, among others the following names, well known to pharmacists, are mentioned: Bechamp, Berthelot, Boullay, Helmont, Leeuwenhoek, Liebig, Ludwig, Woehler, Van't Hoff.

In the Foreword of the "Commemoration Volume," which memorializes those who made the Panama Canal an achievement of modern science, it is written "medicine consists of those facts, gathered from the various sciences, which can be utilized in the prevention or cure of disease." And the last paragraph opens with the words that "The present volume is an incomplete and imperfect statement of what medicine has done, is doing and an indication of what it may do for common good." Pharmacy has a part in the wonderful achievements of medicine and a rightful claim to a reasonable and intelligent appreciation "of what it has done, is doing and may do."

Pharmacy has continuing and greater duties to perform in the promotion of the interests of the people; its votaries have reasonable satisfaction in having met their responsibilities and opportunities with a fair degree of success, and realize that study and research increase both responsibilities and opportunities—pharmacists are co-workers in medical science, and none of the associated professions can hope to achieve greatest success unaided.

The centenary of Lister's birth reminds us not only of the changes he brought about in surgical practice, but of the many who, throughout the past centuries, contributed to his epoch-making discoveries. We also are reminded of the opposition Lister had to overcome in bringing the benefits of these discoveries to humanity. His life, therefore, is not only of interest because of his great achievements, but a source of hope and encouragement for progress in scientific research.

E. G. E.

CODES OF ETHICS.

DR. ARTHUR DEAN BEVAN, former President of the American Medical Association, read a paper before the annual Congress on Medical Education, Medical Licensure and Hospitals, at Chicago, February 14, 1927, on the "Need of Teaching Medical Ethics." He emphasizes the general statement, that "Possibly the most essential asset in life is character; the acceptance of the moral code to guide our actions." This is as applicable to pharmacists as to physicians, and with this thought the AMERICAN PHARMACEUTICAL ASSOCIATION, at its inception, adopted a code of ethics which was revised several years ago in order to make it adaptable to modern conditions. Dr. Bevan points out that the principles of medical ethics are most important but that a code must be modified to conform with changing conditions. He says it should be made perfectly clear that a physician has no ownership in a patient by virtue of the fact that the patient has consulted him, and this part of the guide should be expressed in such a way that the public can understand it and approve it.

The prohibition amendment is discussed at length and considered as a serious problem. Conditions which have arisen should be corrected by constructive criticism, by educational methods and by the acceptance and practice of a code of ethics as clear and simple as the Golden Rule, which will control the lives and actions of the members of the medical profession in their relations with all men. What Dr. Bevan has said in that connection applies with equal force to the members of the pharmaceutical profession. The paper is concluded with the following statement:

"Much can be done to elevate the standards of medical ethics and medical practice, as much has been done to elevate the standards of medical education. This task will require courage and the imagination, good organization, hard work and the united effort of the organized profession of the country. It is a task which must be done. It is a task which is well worth while. It is the purpose of the medical profession of this country to give to the people of this country the full benefit of the great possibilities of scientific medicine."

The substance of the foregoing statement may be applied to pharmacy. The public should be informed relative to the service pharmacy can render and is rendering, and impressed with the possibility of great harm which may result through incompetency and motives which are purely selfish.—E. G. E.

EGGS AND MILK AS ANTIDOTES AGAINST MERCURIC CHLORIDE.

IN A RECENT *Bulletin* of the Department of Pharmacology of Western Reserve University School of Medicine, Dr. Torald Sollmann, O. W. Barlow and M. S. Biskind report on the value of eggs and milk as antidotes against mercuric chloride poisoning. Reference is made to their employment during many years in the treatment of poisoning by mercuric chloride. By the use of this antidote precipitates are formed with the mercuric salt which delay the absorption of the mercury. At the same time they act as demulcents, tending to protect the mucous membrane against contact with the poison. This antidote must be followed by further treatment, for if the mercury remains in the body death occurs with the same dose of mercury whether milk and egg are administered or not. Favorable references are made to the Fantus and phosphite antidotes; the latter consists of sodium phosphite and sodium acetate; the Fantus Antidote of "Sodium hypophosphite, 5 Gm.; water, 10 cc.; solution of hydrogen dioxide, 25 cc.; water, 50 cc.—this amount neutralizes one **poison tablet of corrosive mercuric chloride."** If the amount of the poison taken be known, ten times as much of the hypophosphite should be given as of the poison taken; this should be followed by copious lavage in a very dilute solution of the antidote. This may be followed by a safe dose of the antidote which is to be retained and repeated every eight hours, for several days.

The report is comprehensive as far as the use of eggs and milk is concerned. The concluding comment made is as follows: "In poisoning by mercuric chloride, prompt administration of eggs or milk would be useful to delay absorption and local action, provided they are followed by emesis or lavage, or preferably both if the stomach is full. We have been quite impressed with the difficulty, and sometimes the impossibility, of effectively washing the stomach if it contains undigested food. Not only was it impossible to withdraw the food, but by being sucked against the opening of the tube it prevented also the withdrawal of fluid.

"Raw eggs and milk precipitate the mercuric chloride about equally effectively. Milk would have the advantage that it would spread more rapidly over the stomach and would therefore act more promptly. It may be best to administer first a glass or two of milk, then several raw eggs, to increase the protein without too much bulk. Egg white does not have any advantage over the whole eggs.

"If the tablets have been swallowed dry, and if milk is not available, it would be advisable to administer half a glass of water just before the eggs are given to prevent the cementing of the tablet by the egg white."

Numerous recent suicides have prompted discussions on antidotal methods in the treatment of poisonings.—E. G. E.

Comment on bill to reorganize Prohibition Service will be found immediately following end of Department of National Association of Boards of Pharmacy.

SCIENTIFIC SECTION

FURTHER OBSERVATIONS ON THE ANTI-DIABETIC PROPERTIES OF TECOMA MOLLIS.

BY G. G. COLIN.*

In a previous paper[1] we informed about some observations of the effect of *Tecoma mollis* extracts when applied to the diabetic patient. The insulin-like action could not be properly controlled due to lack of facilities regarding diet and apparatus.

The present observations deal with the oral administration of these extracts as observed by prominent medical men in years gone by, as well as with the effects in cases under our control.

Back in 1899, at the Instituto Medico Nacional, this investigation was undertaken. Infusions of *Tecoma mollis* were applied hypodermically to dogs, using progressive concentrations up to a volume representing the active extractives of 8 Gm. of material (volume of extract not stated), without untoward effects. Doves were also used in these tests and were given as much as 40 Gm. of extract. With high doses vomiting and diarrhea followed, effects which showed consistently with the administration of 10 Gm. and up. With less than 10 Gm. no undesirable effects followed.

After several trials with animals with artificial diabetes (phlorizin) it was concluded that the drug had no effect under those conditions. The following conclusions were reached:

1. The drug is not toxic to animals.
2. It may be used over long periods of time without harmful effects, in man.
3. Anti-diabetic action is not apparent in artificial diabetes (phlorizin).
4. As a general tonic it may occupy a prominent place in national therapeutics.
5. Although its action has not been well defined, its effects are well proven.

Mr. L. L., intimately known by the investigating physicians of the Institute Medico Nacional, used this drug, alternating it with other anti-diabetic preparations and congratulates himself because of its use.

Dr. Aleman gives the following data about himself, a diabetic:

"Without causing the disappearance of diabetic symptoms, my health is good, thirst is diminished considerably. The drug has a decidedly beneficial effect in digestive disturbances."

Drs. Terres and Bulman report on three cases as follows:

Case I.—A case of pancreatic diabetes. Twenty-four hour output of urine was 2095 cc. with 7 per cent glucose. An infusion representing 100 Gm. of the drug given daily gave negative results.

Case II.—In this case glucose fell from 2.5 per cent to 1.2 per cent. Urea diminished from 26 to 21 Gm. and with the continued use of 5 Gm. of drug daily a very decided general improvement was observed.

Case III.—No data given, only a negative result is reported. Dr. Armendaris reports the following case:

In 1901, Dr. M. took an infusion of *Tecoma mollis*, in September. With the daily use of the infusion and at the end of 23 days glucose had fallen from 3.6 per cent to 2.2 per cent and at

* Central Chemical Laboratory, Mexico. [1] JOUR. A. PH. A., p. 556 (July 1926).

the same time his general condition had improved noticeably, in spite of the fact that he had not followed a strict diet.

Dr. Cicero reports:

A gouty diabetic, female, with 1750 cc. urine and 4.1 per cent glucose improved to 1200 cc. urine with 0.6 per cent glucose. (Dose of drug and length of time used not stated.)

It will be noticed that of the seven cases reported, two showed no improvement, while the other five were benefited by the administration of the drug. It is unfortunate that the data given are not very precise for the factors' time, dosage, diet, blood sugar, weight, etc., are not as accurately stated as would be desirable in order to be able to draw more or less definite conclusions.

In our previous report, we observed a hypoglucemic effect with the hypodermic administration of the extract to the diabetic patient, but had no definite data regarding the effects of its oral administration.

The two cases under our control and observation over a period of about six months, at the Hospital de Jesus, showed improvement. Patient E-9 died of pneumonia while we had her under observation, having withdrawn the treatment in order to obtain some data about her condition when subjected to a dietetic treatment without drugs. Patient E-12 left the Hospital improved.

Outside patients who were taking the treatment expressed the following effects observed on themselves with the oral administration of the extract in the form of drops. The dose varied from 25 drops before meals, 3 times daily, to 50 drops. The results were as follows:

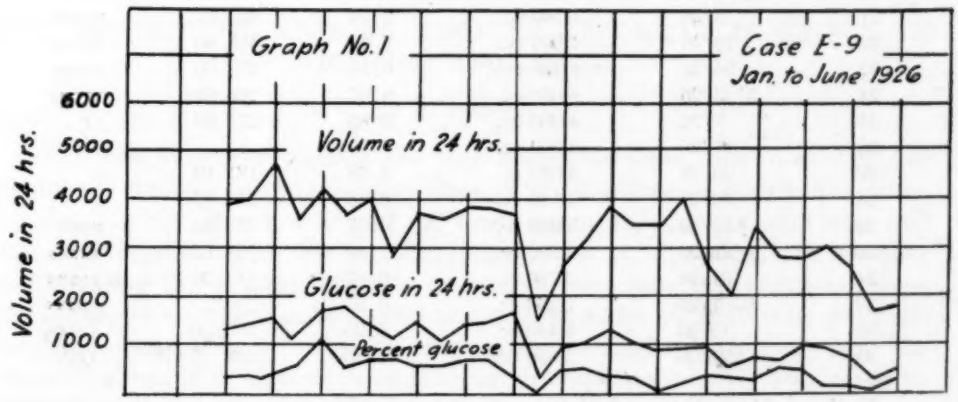
1. In all cases thirst was diminished and consequently the 24-hour volume of urine decreased.
2. In no case did the decrease in volume of urine correspond to a proportionate rise in glucose concentration, dietetic factors remaining constant.
3. Some patients stated that they had felt aphrodisiac effects (stimulation of sexual desire). These patients were over 60 years of age, male.
4. A remarkable increase in appetite was manifested by several patients (the extract has an intensely bitter taste). One patient who had been under insulin treatment previously refused to continue the treatment, because the increase in appetite interfered with his dietetic habits. This effect is not permanent. It is felt only during 3 or 4 days, at the beginning of the treatment.
5. It was impossible to state in definite percentages the number of those benefited and of the negative cases. Outside patients usually discontinue the treatment at the first signs of improvement.
6. Our observations agree with those of the other investigators mentioned in cases wherein, although the glucosuria persists, the general health of the patient is improved.
7. In a number of cases the results were absolutely negative, in every respect.

The results of the urine analyses of the two patients under our control, E-9 and E-12, were the following:

TABLE I.—PATIENT E-9.

No.	Date.	24-hour volume. Urine.	Per cent sugar.	Gm. sugar.	Diacetic acid.
1	1/18/26	3,900 cc.	6.66	260.00	none
2	2/ 1/26	4,000 cc.	6.75	270.00	none
3	8/26	4,680 cc.	6.25	292.00	none
4	15/26	3,600 cc.	6.67	240.00	none
5	19/26	4,220 cc.	7.50	316.00	none
6	22/26	3,640 cc.	9.50	345.80	none
7	26/26	4,000 cc.	7.50	300.00	none

8	3/ 1/26	2,830 cc.	8.18	233.00	none
9	6/26	3,700 cc.	8.18	302.70	none
10	8/26	3,000 cc.	7.30	219.00	none
11	13/26	3,600 cc.	7.65	273.20	none
12	15/26	3,820 cc.	3.30	126.06	none
13	19/26	3,800 cc.	8.11	308.20	none
14	22/26	3,680 cc.	8.11	298.00	none
15	4/ 1/26	1,500 cc.	5.26	78.94	none
16	5/26	2,600 cc.	7.04	183.10	none
17	19/26	3,200 cc.	7.25	232.00	none
18	26/26	3,800 cc.	6.58	250.00	none
19	5/ 3/26	3,440 cc.	5.88	202.30	none
20	7/26	3,460 cc.	5.10	176.50	none
21	13/26	4,000 cc.	....	.....	....
22	19/26	2,650 cc.	6.85	181.52	none
23	22/26	2,000 cc.	6.66	133.32	none
24	28/26	3,420 cc.	6.67	228.11	none
25	31/26	2,800 cc.	7.69	215.38	none
26	6/ 7/26	2,840 cc.	6.84	194.54	none
27	12/26	3,000 cc.	5.88	176.46	none
28	19/26	2,600 cc.	5.68	152:93	none
29	21/26	1,680 cc.	6.67	95.46	none
30	24/26	1,800 cc.	....	120.00	none



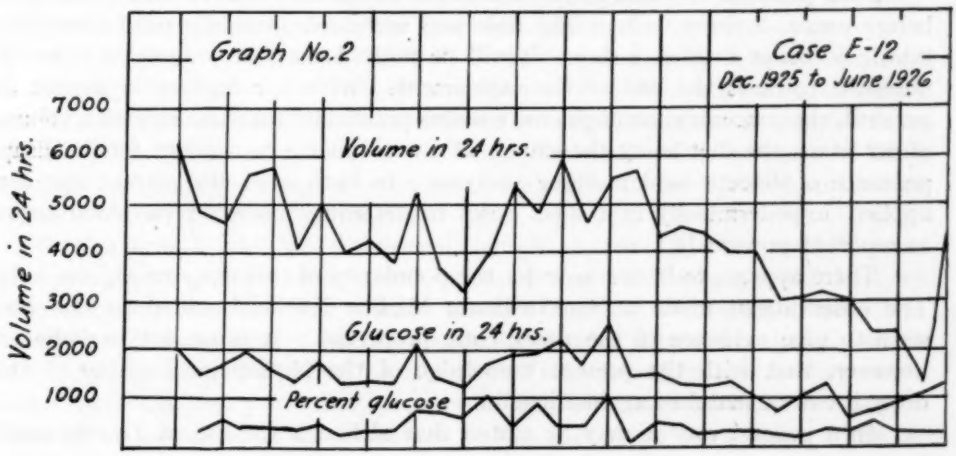


TABLE II.—PATIENT E-12.

No.	Date.	24-hour volume. Urine.	Per cent sugar.	Gm. sugar.	Diacetic acid.
1	12/ 7/25	6,200 cc.	6.67	406.90	xxxxx
2	14/25	4,840 cc.	6.41	310.24	xxxxx
3	21/25	4,600 cc.	7.69	353.78	xxxxx
4	28/25	5,600 cc.	7.14	399.84	xxx
5	1/11/26	5,750 cc.	....	.....	....
6	18/26	4,100 cc.	6.67	297.08	xxxxx
7	2/ 1/26	5,000 cc.	7.24	362.30	xxxxx
8	8/26	4,000 cc.	6.25	250.00	xxxxx
9	15/26	4,200 cc.	6.88	289.30	xxxx
10	19/26	3,800 cc.	6.92	253.07	xxxx
11	22/26	5,220 cc.	8.40	420.28	xx
12	26/26	3,624 cc.	8.36	291.21	none
13	3/ 1/26	3,240 cc.	8.18	265.64	xxxxx
14	6/26	3,900 cc.	9.37	365.60	xxxxx
15	8/26	5,400 cc.	7.00	378.00	xxxxx
16	13/26	4,800 cc.	8.11	389.33	xxx
17	15/26	5,960 cc.	7.30	435.08	xxx
18	19/26	4,624 cc.	7.30	337.00	xxxxx
19	22/26	5,580 cc.	9.10	502.00	xxxx
20	4/ 1/26	5,640 cc.	5.55	313.30	xx
21	5/26	4,240 cc.	7.14	302.72	none
22	19/26	4,500 cc.	7.04	316.80	xxxxx
23	26/26	4,420 cc.	6.15	272.00	xxxxx
24	5/ 3/26	4,000 cc.	6.67	266.64	xxxxx
25	7/26	4,000 cc.	6.85	274.00	xx
26	17/26	3,000 cc.	....	.....	....
27	20/26	3,050 cc.	5.95	181.50	x
28	22/26	3,180 cc.	6.66	211.97	x
29	24/26	3,080 cc.	6.67	258.80	none
30	28/26	2,200 cc.	7.69	168.63	xxxxx
31	31/26	2,780 cc.	6.67	185.31	xxxxx
32	6/ 7/26	1,250 cc.	6.67	.....	xxxxx
33	19/26	4,440 cc.	6.25	277.00	xxxxx
34	21/26	2,880 cc.	6.85	120.00	xxxxx

Both patients E-9 and E-12 were started with the extract taking 25 drops before meals, 3 times daily. The dose was increased gradually until they were taking 50 drops 3 times a day. It will be noticed that the volume of urine diminished towards the end of the experiment. With a reduction of almost 50 per cent, the concentration of glucose remains practically the same as with a volume of 6.2 liters, the diet being the same. We were unable to account for the disappearance of diacetic acid in three analyses. In both cases the extract was also applied hypodermically in 1–3-cc. doses to determine its effect on blood sugar, as reported previously.

There appears to be a reason for the popularity of this drug among the laity. The observations made at the Instituto Medico Nacional added to our own seem to give evidence of the therapeutic properties. It must not be believed, however, that with the present knowledge of the physiological action of this drug, it can be matched against insulin.

In a general way it may be stated that although the use of *Tecoma mollis*

benefits some types of diabetic patients, it has not been defined what types of diabetes it is best suited for.

The fact that some old patients have felt aphrodisiac stimulation may point out its properties as a general tonic.

It has been believed that *Tecoma mollis* is a diuretic, but facts seem to point to the contrary. Its action is anti-diuretic and we venture to suppose that there may be a possible stimulation to pituitary secretion by the use of the extract.

We have planned experiments to determine the action of the essential oil from the plant as well as to investigate the action of a fraction of proteins or proteoses which can be precipitated from the extract, freed from gums and resins by half saturation with ammonium sulphate.

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G. G. COLIN,
January 2, 1927.

THE POTENCY OF VARIOUS SAMPLES OF DIGITALIS GROWN IN BRITISH COLUMBIA.

BY M. I. SPARKS.

The wild variety of digitalis has been known for some time to exist in fair abundance throughout the southern parts of the province of British Columbia, Canada. Indeed, the climatic and soil conditions of this district seem very well suited to the flourishing, but uncultivated, growth of this plant. In a report by Dauphinee (3), in 1924, which is referred to more fully below, it was shown that the digitalis content of these wild plants (kept under cultivation for one year) was quite comparable with that of leaves grown in England, Germany and the United States. With these facts in mind an attempt has recently been made to keep these plants under cultivation for commercial purposes; indeed the practicability of growing these plants has been demonstrated.

In the Spring of this year, Prof. V. E. Henderson, while on a tour through the Western Provinces visited and became interested in the work which was being done at this digitalis farm. Since no definite investigation of the potency of these cultivated plants had been made it was deemed advisable that an assay of these plants should be carried out in order to observe how they compared with those hitherto obtained from foreign markets.

On this farm, in addition to the usual *Digitalis purpurea L.* with purple blooms, there were also *Digitalis purpurea* with white blooms, and the botanically distinct species *Digitalis lutea L.* The relative number of plants with white blooms was quite large; if these were of inferior glucosidal content it would materially affect the average quality of the leaf, so samples of leaves from plants having white blooms were also assayed. The potency of *Digitalis lutea* leaves was also determined, as references in the literature to this species are very few. While on

most of the rows of plants no special fertilizer had been employed, a few rows were fertilized with sodium nitrate. Leaves grown from plants in these fertilized plots were also assayed. Since this farm is as yet quite small, all samples of leaves were grown on a relatively small area of land. To further obviate the effect of local conditions on results obtained, the samples were taken from as close parts of the plot as was possible, so that the leaves of different samples might be taken from plants only four or five rows one from the other. Gathering, drying and packing were done under as similar conditions as possible.

The plants used, of all the varieties, were grown from seeds of mixed origin, both Canadian and English, and in every case were of the second year's growth. The leaves were gathered at the midsummer cutting and the average yield per acre was about 1500 pounds of the leaf.

In the case of the plants fertilized with sodium nitrate the fertilizer was added once only, in March of this year (1926). The yield of leaves from these fertilized plants was about 15 per cent larger than the figure quoted above, or about 1725 pounds per acre. The nitrate also resulted in a much better color in the plants.

As comparison for these native-grown products, there were used: digitalis leaf grown in England and standardized for commercial use; a sample of the Standard digitalis leaf as supplied by the International Conference for Standardization of Biological Products, prepared by Prof. Magnus of Utrecht.

All samples of leaves, except the Standard, were obtained through Ayerst, McKenna & Harrison Ltd., of Montreal. The four samples of Canadian leaves were obtained in a dried state and were ground by us to pass a No. 20 mesh. The English leaves, of the 1925 crop, were obtained in the dried and already ground condition, the degree of grinding being much finer than No. 20. The same remarks apply to the Standard powder.

METHODS.

The methods used in assaying these samples were two in number; the one-hour frog method as described in the U. S. P. X; and the Magnus cat method as developed by Wijngaarden (1).

In the experiments with cats, ether anesthesia was used, just sufficient to keep the animal quiet after the preliminary preparation was completed; artificial respiration was used throughout. The leaf to be tested was made up in a one-half per cent infusion, rendered isotonic and filtered. Injections were made at body temperature into the external jugular vein; the first few cc. (3 to 5) at a rapid rate, the remainder at a slow constant rate such that the experiment was completed in not less than thirty minutes and not more than fifty (usually $^1/_2$ to 1 cc. per minute). The end-point was usually quite definite, the heart arrest being determined by palpatation through the thoracic wall and immediately confirmed by thoracotomy. The absence of any beats in the ventricle was considered the test of the end-point though contractions of the auricle, or a few fibrillary movements in the ventricle were allowed.

In the experiments on frogs, 10% tinctures and 5% infusions were used. The frogs were of the species *Rana pipiens* and weighed between 17 and 30 Gm. Prior to use the frogs were kept in cold running water and some time before being used were brought to the laboratory, weighed (to the nearest half Gm.) and

placed in separate glass jars containing a thin layer of water, all set in a water-bath that was kept at a temperature of 20° C. Injections were made by means of a tuberculin syringe through the mouth into the ventral lymph sac. Just before the end of the hour the frogs were pithed, both brain and spinal cord, and opened to expose the heart. The condition at the end of the hour was recorded; frogs showing any trace of the fluid in the lymph sac were discarded; experiments were continued till consistent results were obtained. A positive result was recorded only when the ventricle was so well contracted as to appear a pale pink color, the auricles engorged with blood and no beats occurred; under such conditions, mechanical stimulation still caused one or two contractions.

1. RESULTS WITH ONE-HALF PER CENT INFUSIONS BY CAT METHOD.

In these experiments the infusions were made fresh each morning and used on three (or rarely four) cats consecutively, never later than the afternoon of the same day. The results in most cases lay within the experimental variation allowed by the formula of Wijngaarden, *i. e.*, "the mean of the percentage deviations from the average value of the N estimations carried out is less than $6.67 \sqrt{n-1}$." Any results exceeding this limit were discarded and an additional animal used. The average minimum lethal dose is calculated in cubic centimeters per kilogram of cat (dead weight); in milligrams of digitalis leaf per Kg.; and in terms of the number of cat M. L. D. in 1 Gm. of digitalis leaves.

Infusion.	Lethal dose in cc. per Kg. of cat. Cat 1.	Cat 2.	Cat 3.	Average L. D. In cc. per Kg.	In mg. per Kg.	No. of L. D. in 1 Gm. digitalis.	Order of potency.
1. Dig. purpurea.....	21.83	24.41	23.66	23.30	116.50	8.58	6
2. Dig. purpurea (Sodium Nitrate).....	14.18	14.00	13.45	13.88	69.40	14.41	1
3. Dig. purpurea (White Blooms).....	23.38		22.57	22.97	114.85	8.71	5
4. Dig. lutea.....	16.80	17.52	19.73	18.02	90.10	11.10	2
5. Dig. purpurea (English)	19.18	18.14	20.61	19.31	96.55	10.36	4
6. Standard.....	19.09	18.30	18.00	18.74	93.70	10.67	3
	Cat 4.....		19.57				

2. RESULTS WITH 10 PER CENT TINCTURE BY FROG METHOD.

These tinctures were made according to the formula in the British Pharmacopœia, although the description of the method of assay was taken from the U. S. P. X. They were then so treated that the M. L. D. per Gm. of frog would be contained in about 0.015 cc. and that the alcohol content of the injected fluid was less than 20%. Thus 100 cc. of the 10% tincture made with 70% alcohol was evaporated under vacuum to about 70 cc.; made up to 100 cc. with distilled water; then, as required for experiment, diluted 2.5 times and rendered isotonic with sodium chloride.

Typical Final Experiments.

TINCTURE I—*Digitalis purpurea.*

0.015 cc. per Gm. of frog—slow regular beat.
0.016 cc. per Gm. of frog—ventricle contracted, auricles dilated, no beats.
0.017 cc. per Gm. of frog—ventricle contracted, auricles dilated, no beats.
Therefore M. L. D. = 0.016 cc. per Gm. of frog.

TINCTURE II—*Digitalis purpurea*—fertilized with sodium nitrate.

0.009 cc. per Gm. of frog—slow beats.
0.010 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.011 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.012 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.010 cc. per Gm. of frog.

TINCTURE III—*Digitalis purpurea*—white blooms.

0.017 cc. per Gm. of frog—slow beats.
0.018 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.019 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.020 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.018 cc. per Gm. of frog.

TINCTURE IV—*Digitalis lutea*.

0.014 cc. per Gm. of frog—slow beats.
0.015 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.016 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.017 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.015 cc. per Gm. of frog.

TINCTURE V—*Digitalis purpurea*—English.

0.014 cc. per Gm. of frog—slow beats.
0.015 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.016 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.015 cc. per Gm. of frog.

TINCTURE VI—Standard.

0.012 cc. per Gm. of frog—slow beats.
0.013 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.014 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats
0.015 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.013 cc. per Gm. of frog.

	Tincture.	M. L. D. Cc. per Gm. of frog mg.	M. L. D. Digitalis folia per Gm. frog.
I.	Digitalis purpurea	0.016	0.64
II.	Digitalis purpurea ($NaNO_3$)	0.010	0.40
III.	Digitalis purpurea (white blooms)	0.018	0.72
IV.	Digitalis lutea	0.015	0.60
V.	Digitalis purpurea (English)	0.015	0.60
VI.	Standard	0.013	0.52

As in all standardization by this method, rough approximations were first used and then series at limited intervals such as the above. In some cases individual frogs gave variant and not typical results and in some cases when several series with the same tincture were compared, the exact end-point was hard to determine; but the amount of tincture which arrested the ventricle in over 50 per cent of the cases was taken as the M. L. D.

3. RESULTS WITH 5 PER CENT INFUSIONS BY FROG METHOD.

In order that infusions might be used on frogs, it was necessary that they be more concentrated than $^1/_2\%$ strength. To concentrate a $^1/_2\%$ infusion occupied too great a length of time to avoid deterioration effects, therefore an attempt

was made to make use of a 5% infusion. These were made exactly the same as in the method described by Winjgaarden for ½% infusions only using a proportionately larger percentage of leaf.

This method with 5% infusions was tried on all samples of leaf, but in all except the first two samples, the results of which are given below, so great difficulty was experienced in getting complete absorption that it was abandoned.

INFUSION I—*Digitalis purpurea.*

0.015 cc. per Gm. of frog—slow beats.
0.016 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.017 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.018 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.016 cc. per Gm. of frog = 0.80 mg. per Gm.

INFUSION II—*Digitalis purpurea* ($NaNO_3$ fertilization).

0.009 cc. per Gm. of frog—slow beats.
0.010 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
0.011 cc. per Gm. of frog—ventricle contracted, auricle dilated, no beats.
Therefore M. L. D. = 0.010 cc. per Gm. of frog = 0.50 mg. per Gm.

4.—TABLE OF RESULTS BY ALL METHODS.

	Sample.	M. L. D. per Kg. of cat in mg.	Order of potency.	M. L. D. in mg. per Gm. frog. 10% Tincture.	Order of potency.	5% Inf.
I.	Digitalis purpurea.....	116.50	6	0.64	5	0.80
II.	Digitalis purpurea ($NaNO_3$).....	69.40	1	0.40	1	0.50
III.	Digitalis purpurea (white bloom)....	114.85	5	0.72	6	
IV.	Digitalis lutea.....	90.10	2	0.60	3	
V.	Digitalis purpurea (English).....	96.55	4	0.60	4	
VI.	Standard.....	93.70	3	0.52	2	

DISCUSSION.

1. The Standard Digitalis powder gave an average M. L. D. for cats of 18.74 cc. per Kg. This result is somewhat higher (*i. e.*, the infusion was more potent) than the average result obtained by a number of workers of 19.63 (± 1.36), as given by Knaffl-Lenz (2), but is close to values obtained by Dale, London, 18.11, and Magnus, Utrecht, 18.11, 18.65.

The average M. L. D. obtained with frogs using alcoholic extracts, of 0.52 mg. per Gm. is again definitely at the more potent end of the range of values that have been obtained by several investigators. Knaffl-Lenz gives the average of these results to be 0.68 mg. (± 0.16).

No explanation can be given of why this Standard should by both these methods assay slightly but definitely higher in digitalis content than the average of results obtained by others. Of interest, however, in this connection is the result of Voegtlin (taken from the article by Knaffl-Lenz), the only American worker quoted, who obtained a M. L. D. of 0.48 mg. per Gm. of frog (*R. pipiens*). This result is the most potent value obtained and is definitely higher than any result obtained in Europe. There is, therfore, the barest suggestion that assay in America tends to show a higher digitalis content than those performed with the same powder in Europe.

2. Table IV gives the results by both the frog and cat methods; examination of these shows that while the results are superficially the same, yet they are not

strictly comparable. Thus the sample which assays the strongest by both methods is II; the weakest is I by the cat, III by the frog method. Further comparison is shown by the figures in Table IV. We thus see that comparing the two methods, while the order of magnitude is roughly proportional, yet the comparison can be pushed no farther than this. This discrepancy between the two methods had been noted by other workers, most recently by Knaffl-Lenz in the case of Standard, A and B, powders (as prepared by Magnus).

3. Comparison of the samples of Canadian-grown digitalis inter se reveals the following facts. *Digitalis purpurea*, purple blooms and white blooms, by the cat method show a negligible difference, if anything slightly greater potency in favor of the white blooms; the frog method, on the other hand, shows the plants with white blooms to be definitely weaker than their coloured relatives. If, as has been suggested, the one-hour frog method indicates more the content of digitalin, rather than that of digitoxin, the above results would indicate that the plants with white blooms have a smaller content of digitoxin than those with purple blooms but that the total content of digitalin plus digitoxin (and other glucosides) is slightly greater in the white flowered than in the purple flowered plants.

Digitalis lutea by both frog and cat methods is stronger than either of the *Digitalis purpurea* samples; the difference, however, is more striking by the cat than by the frog method.

The values obtained for the sample of English Digitalis shows that by the cat method it is definitely more potent than the Canadian Digitalis purpurea, but weaker than the *lutea* sample; by the frog method the *Digitalis purpurea* is again weaker (though not so markedly) while the *lutea* assays at the same strength.

White and Morris (4), could find no difference clinically or by assay between the strength of *Digitalis lutea* and the ordinary variety. In a recent paper, Konnerth and Pickering (5) have duplicated these results. We can confirm these observations when comparing *Digitalis lutea* and the English sample, but when comparison is made with the native-grown *Digitalis purpurea*, the lutea shows a definitely higher assay. Pratt and Morrison (6), also found that *Digitalis lutea* assayed higher than the great majority of their *Digitalis purpurea* samples. No difference such as the first observers remark, between *lutea* and *purpurea* (*i. e.*, absence of vomiting, convulsions, emptying of bowels with lutea but present with purpurea) were observed. We saw no indication of any of these (the bladder was usually emptied) in cats using infusions of either *Digitalis purpurea* or *lutea*.

4. *Effect of fertilizers.*—Dauphinee in his report, claims that cow manure was the most effective fertilizer that was used, increasing the yield of leaves, twice, but from his tables it does not appear to have increased the digitalis content of the leaf. Ammonium sulphate was of slight beneficial effect, while superphosphate was, if anything, detrimental to the culture of these plants.

Our experiments show the effect of only sodium nitrate as a fertilizer, but the results demonstrate that this chemical appears to have a very definite and marked ability to increase the digitalis content of *Digitalis purpurea*. The leaves gave the highest content of any examined and are approximately 23% more potent than the Standard by both the cat and frog methods, and 40% than the unfertilized *Digitalis purpurea* by both methods. Not only is the glucoside content of the leaf increased but also the actual yield of the leaf per acre, so that sodium

nitrate has a dual and very definite power to improve the production of digitalis.

It is extremely doubtful if any clinical difference would be observed between these fertilized and unfertilized plant preparations, in spite of the assayed difference of 40 per cent, because no difference has been found clinically between the preparations Standard and A (Magnus) which show a like discrepancy of 40 per cent assayed strength.

Thus the above results indicate that Canadian-grown digitalis, in the mixture of samples used commercially is quite up to the average strength. A sample consisting of equal parts of the *Digitalis purpurea* varieties of Canadian leaf examined should have a M. L. D. for a cat of 100.25 mg. per Kg. and for a frog 0.59 mg. per Gm. as compared with the values 96.55 mg. per Kg. and 0.60 mg. per Gm. found for the English sample.

Further, the results show that the use of infusions with the frog method is attended by two very considerable difficulties; difficulty in preparing an infusion of sufficient concentration which holds all the active glucosides contained in the leaf; and difficulty in obtaining absorption of such infusion from the lymph sac of the frog.

SUMMARY.

1. Using the Standard Digitalis powder by the cat method the M. L. D. was 18.74 cc. per Kg.; by the one-hour frog method 0.52 mg. per Gm. of frog. These are compared with the values obtained by other workers.

2. The results obtained by the cat method are compared with those obtained by the frog method, and the discrepancies that occur between the two methods, are again noted.

3. Comparison of the potency of *Digitalis purpurea*, purple blooms, with those bearing white blooms, shows very nearly equal values by the cat method, while by the frog method the former are definitely more potent.

4. *Digitalis lutea* assays definitely higher in glucosidal content than *Digitalis purpurea*, by both methods. There was no suggestion in the experimental work that *Digitalis lutea* is less toxic in its action than *Digitalis purpurea*.

5. A mixed sample of Canadian *Digitalis purpurea* shows a potency almost equal to that of the English-grown standardized leaf examined.

6. The effect of sodium nitrate as a fertilizer is to increase the yield of leaf per acre by 15 per cent, but more markedly it increases the glucosidal content of that leaf, 40 per cent more potent than the unfertilized *Digitalis purpurea*.

This work was suggested by Prof. V. E. Henderson, and was carried out under his direction, for which my thanks to him are due.

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A PHYTOPHARMACOLOGICAL STUDY OF DIGITALIS ASSAY.*

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INTRODUCTORY.

It is well known that up to the present time the only way of estimating the therapeutic efficiency of Digitalis preparations has been through biological assay. Such methods have been discussed in the United States by Edmunds (1), Hale (2) and a host of later writers, and in Europe by Ziegenbein (3), Führer (4), Storm Van Leeuwen (5), Heinz (6), Kobert (7), Straub (8), Heffter (9), Wiechowski (10), Modrakowski and Sikorski (11), Leyko (12) and others. It is equally well known that all physiological or biological assay methods as yet described are quite unsatisfactory. Every one and all of them have certain advantages on the one hand, and a great many disadvantages or disqualifications on the other hand. Thus the frog method as first introduced by Houghton (13), and later elaborated by Hamilton (14), Focke (15), Gottlieb (16), Lyons and Famulener (17) and others, while quite simple in its self, is subject to all kinds of variations; the species of frogs, the season of the year, the temperature at which the animals are kept, and the different susceptibility of different individual frogs, all play a rôle. The most important method at present in use, in the opinion of probably the majority of pharmacologists, is the cat method of Hatcher and Brody first described in 1910 (18) and later slightly modified by various other investigators. This method being an intravenous one and using warm-blooded animals gives, in the opinion of clinical pharmacologists, a better idea of the therapeutic efficiency of the Digitalis preparations tested. Its importance and value in pharmacological and clinical work has been emphasized by Rowntree and Macht (19), Eggleston (20), Haskell and Courtney (21), Storm Van Leeuwen, den Besten (22), Kuroda (23) and many others. Nevertheless even in this method marked variations are obtained which have not yet been satisfactorily explained, as pointed out recently by de Lind Van Wijngaarden (24) and others. Besides the above two principal methods of Digitalis assay which have been recognized by the U. S. P., other curious and interesting methods have been described. Thus Pittenger and Vanderkleed published a gold fish method (25), Wentz (26) suggests the rat (white rat) as a suitable test subject; and Reed and Vanderkleed (27) and recently Knaffl-Lenz (28) have recommended the guinea-pig as a suitable animal for testing Digitalis preparations. Schmiedeberg (29) and Straub recommended the use of excised frogs' hearts. A colorimetric method has also been described by Knudson and Dresbach (30) but has not met with much success in other hands (Wible (31)). The percentage of variation in the cat method has been shown to decrease, if vagotomy is first performed (Macht and Colson (32) and de Lind Van Wijngaarden).

In connection with studies in Phytopharmacology and Phytotoxicology carried on by the senior author, with various collaborators (33), (34), a few experi-

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ments were incidentally made on the effect of Digitalis solutions on the growth of some seedlings. A one per cent solution of Tincture of Digitalis was made in Shive solution and the growth of seedlings of *Lupinus albus* immersed in this, was compared with the growth of similar seedlings in a pure Shive or nutrient solution for plants. It was found that the digitalis solutions produced a distinct inhibition in the growth of the seedlings which was not accounted for by their alcohol content, inasmuch as control experiments with exactly equivalent amounts of alcohol alone without digitalis extract were found not to be as toxic. This observation stimulated the authors to further work and experiments were made with various concentrations of digitalis in Shive solution maintaining the alcohol content in every case the same. It was found that the inhibition of growth in the seedlings used was proportional to the concentration of the digitalis. This suggested the possibility of developing a new method for the assay of digitalis solutions by the use of living plants or seedlings. Accordingly a large series of experiments were begun with this end in view and the results obtained were so remarkable and constant that such a phytopharmacological method of testing was found to be very valuable in comparative studies of digitalis preparation along other lines, such as their deterioration by light as conducted by the authors. It is proposed to describe this plant or phytopharmacological method in the present paper.

METHOD.

The toxicity of digitalis preparations was studied by the authors on growth of the seedlings of *Lupinus albus* by measuring carefully the elongation of the well-defined single, straight rootlets. In order to eliminate all variations due to changes in hydrogen-ion concentration, bacterial growth, fungi, etc., tinctures of digitalis alone were employed exclusively in this work. The *Lupinus albus* is especially adapted to experiments in plant physiology and pharmacology because it can be easily germinated and the growth of the roots accurately measured. The procedure employed in the present experiments was as follows:

The dry seeds were soaked over night in tap water at the ordinary room temperature. On the following day the swollen seeds were planted with the hilum downward in finely ground moist sphagnum moss. The seeds were then placed in the dark and kept at a constant temperature of about 20° C. On the third day after planting the seeds, the seedlings are of convenient size, the length of the roots being generally from 20 to 30 millimeters. The length of these roots can be accurately measured because of a definite line of demarkation indicating the border line between root and stem. After recording the exact length of a root, the seedling is placed in an upright test-tube of hard glass containing a nutrient solution for plants, the seed resting on the upper edge of the tube. The solution employed was a so-called Shive solution (35), which contains calcium nitrate, magnesium sulphate and mono-potassium acid phosphate. Such a solution is prepared by mixing 10.4 cc. of a 0.5 molar solution of calcium nitrate, 30 cc. of a 0.5 molar solution of magnesium sulphate and 36 cc. of a 0.5 mono-potassium phosphate solution, with distilled water sufficient to make one liter. The normal growth of the Lupine rootlets was studied by immersing the seedlings in a mixture of normal Shive solution with an equal part of distilled water. The

effect of unknown substances, as studied by Macht and co-workers in other connections, was to add a definite percentage of the unknown to the distilled water and then mixing with an equal part of Shive.

In the present work the normal growth of the seedlings was first determined by using equal parts of distilled water and the Shive solution. Then a one per cent solution of tincture digitalis was made up by taking 1 cc. of tincture digitalis and adding to it sufficient water to make 50 cc. This was mixed with 50 cc. of Shive solution and the growth of seedlings in such a one per cent solution of digitalis tincture was noted. Inasmuch as tincture digitalis contains a definite amount of ethyl alcohol the growth of the seedling in the digitalis was compared not only with the growth in normal Shive but also with a Shive solution containing one per cent of alcohol of exactly the same strength as the original tincture. In this way it was found that a digitalis solution definitely and markedly inhibits the growth of the plants on the one hand, and that such an inhibition of growth was not due to the alcoholic content of the same. Such preliminary experiments with a one per cent solution of digitalis were followed by more elaborate experiments with various concentrations, the procedure followed being very much the same as the foregoing. In these extensive experiments the average growth of at least ten seedlings was determined for each solution used. First a series of ten or more hard glass test-tubes were filled with equal parts of Shive solution and distilled water and healthy seedlings were carefully measured and immersed in each. Then a series of an equal number of hard glass test-tubes was filled with a one per cent solution of alcohol, the alcohol concentration being exactly the same as that of the tincture to be examined, and another series of seedlings was carefully measured and immersed in this alcohol Shive solution. Next various percentages of tincture of digitalis were prepared, always maintaining the same alcohol contents while varying the amount of digitalis used. In this way a series of solutions containing tincture of digitalis of various strengths was prepared and their effect on the growth of the plants studied. To make this procedure clearer the following illustration may be given. A one per cent solution of a tincture digitalis is prepared by mixing 1 cc. of the tincture with 49 cc. of distilled water and 50 cc. of Shive solution. A 0.9 per cent solution of tincture of digitalis is prepared by taking 0.9 of the tincture and 0.1 cc. of a 71 per cent of alcohol solution and 49 cc. of water plus 50 cc. of Shive solution. A one-half per cent solution of tincture digitalis is prepared by taking 0.5 cc. of tincture plus 0.5 cc. of alcohol 71 per cent, and 49 cc. of H_2O and 50 cc. of Shive solution. In a similar way any desired percentage of concentration of digitalis for phytopharmacological study was prepared, always taking care to maintain the alcohol contents of all of the solutions exactly the same, in order to determine the effect of the digitalis and not of the alcohol.

After all the solutions have been prepared and all the seedlings have been measured and immersed in them, the plants are placed in the dark, preferably in a thermostat or closed space and left over night at a constant temperature. The temperature throughout the experiment was followed by means of a thermograph, although variations or fluctuations in the temperature were of no significant importance, inasmuch as all the plants or seedlings including the controls were always kept under the same conditions. After a period of twenty-four hours and some-

times twenty hours the seedlings are examined again. The roots are measured and the growth in various solutions is compared with the average growth in normal Shive and also with the average growth in a Shive plus normal alcohol. The results obtained with tincture digitalis are expressed in percentages as compared with the growth in the alcohol Shive control, and may be termed the coefficient or index of growth. In this way numerous experiments were performed with different tinctures, and the results analyzed and correlated.

Figure 1 illustrates four seedlings of *Lupinus albus*, two of which are immersed in normal Shive solution and two others in a solution to be tested.

Figure 2 illustrates how a large number of experiments can be performed at one time. The board in the figure can hold a large series of test-tubes so that each row of seedlings can be used for testing different solutions under exactly the same conditions of temperature, light, etc.

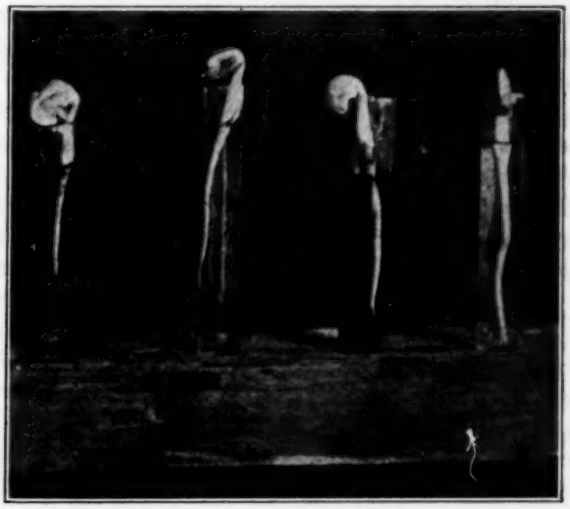


Fig. 1.—Lupinus albus seedlings in normal and test solutions.

RESULTS.

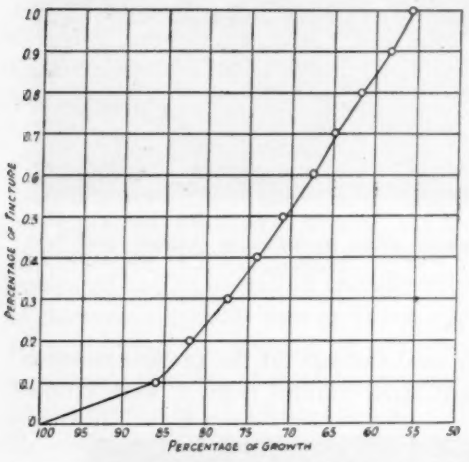
The U. S. P. Tincture of Digitalis was used throughout the present research. Ten different samples of tinctures obtained from various sources were studied

Fig. 2.—A series of experiments on Lupinus seedlings performed at the same time.

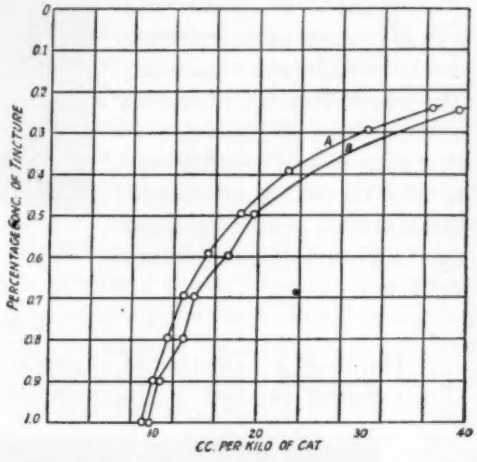
and, as might have been expected, great variations in the potency of the different preparations were noted.

The investigation was begun with an extensive and intensive study of Tincture No. 1. This tincture was prepared according to the specifications of the United States Pharmacopœia and contained 71% of ethyl alcohol. Solutions varying from one-tenth per cent to one per cent of this tincture were prepared

in Shive solution as heretofore described, always maintaining the amount of the alcohol the same, namely, one per cent. Thus when a one per cent solution of the tincture was desired, 1 cc. of the tincture was added to 49 cc. of distilled water and 50 cc. of Shive solution. When fractional percentages of the tincture were required the amount of alcohol was made up to one per cent by adding a sufficient amount of 71% ethyl alcohol to the fraction of cc. of the tincture employed. In all experiments at least ten seedlings were measured and their growth studied in each and every solution examined, so that the figures obtained were an average of at least ten individual biological test objects, that is seedlings. The results obtained with the various concentrations of the tincture were expressed in terms of per cent regarding growth in the one per cent alcohol Shive solution as the norm. In this way it was found that the growth of seedlings in various concentrations of digitalis solutions was, physiologically speaking, in direct ratio to the strength of the solution employed. A marked inhibition was obtained with the one per cent digitalis solution, and the amount of inhibition decreased with a decrease in the



Curve No. 1.—Concentrations of digitalis and growth of seedlings of lupinus albus.



Curve No. 2.—Concentrations of tincture of digitalis and potency on cat's heart.

percentage of the digitalis concentration, so that a curve could be easily plotted expressing the growth of the roots in terms of the concentrations of digitalis.

A large number of experiments were thus performed, using Tincture No. 1 and a composite curve was drawn based on the data thus obtained. The subjoined illustration gives the curve obtained in this way. (Curve No. 1.)

After having studied thoroughly the Tincture No. 1, other tinctures were examined in the same way and on comparing the results obtained with those obtained with the first or what we may call Standard Tincture, it was found that the effect on growth varied with different preparations used. In every case, however, the curve of relation between the toxicity for plants and percentage of digitalis solution used (0.1 to 1.0%) was practically the same as that obtained with Tincture No. 1, so that knowing the toxicity of a one per cent solution of any given tincture A, the toxicity of any other percentage of the same tincture between 0.1% and 1.0% could be calculated by simple proportion from the curve of Tincture No. 1. The variations obtained by this plant method with various

tincture samples agreed very well with the figures obtained concerning their potency by using the cat method. Table I exhibits concisely the results of all of the experiments with the various tinctures. In one column there will be noted the coefficients of growth obtained for the various tinctures by the phytopharmacological method. In the adjoining column are expressed the average potencies of the various tinctures obtained by the cat method. It may be stated at once in this place that the cat units obtained with the various tinctures as here expressed are an *average* of at least three and often five animal experiments, because great variations were obtained by using the cat method. The method of assay followed throughout this investigation was the Hatcher-Brody Method without the concluding Ouabain injection. It has been described by Rowntree and Macht elsewhere and consists briefly in diluting the tincture with ten times the amount of physiological saline solution, and injecting intravenously 10 cc. of the solution for the first five minutes and 1 cc. per minute after that until a stand-still of the heart was produced. In every case a satisfactory cat experiment required a stoppage of the heart before the failure of respiration.

It will be noted from Table No. I, that the results obtained by the plant method compare very favorably with the results obtained by the cat method. Indeed, having determined the potency of the first tincture for both plants and cats, the potency of any other unknown sample of digitalis tincture could be obtained in cat units by simply determing its phytotoxic index and comparing the same with the phytotoxic index of the first tincture.

TABLE I.—ASSAY OF TEN DIFFERENT TINCTURES BY THE PLANT AND CAT METHODS.

No. of tincture.	Plants' index of growth, in one-half per cent solution.	Cats' lethal dose per kilo wt., diluted with saline 1:10.
Tincture 1	72%	9.2 cc.
Tincture 2	76%	10.4 cc.
Tincture 3	70%	See Table No. II
Tincture 4	93%	13.7 cc.
Tincture 5	77%	11.0 cc.
Tincture 6	74%	9.3 cc.
Tincture 7	86%	12.0 cc.
Tincture 8	75%	9.8 cc.
Tincture 9	69%	9.1 cc.
Tincture 10	73%	9.4 cc.

TABLE II.—ASSAY OF TINCTURE NO. 3—BY PLANT AND CAT METHODS SHOWING REMARKABLE VARIATIONS BY THE CAT TESTS.

	Plants' index of growth.	Cats' lethal dose per kilo wt.
Experiment 1	70%	7.3 cc. (Tincture Diluted 1:10)
Experiment 2	70%	9.2 cc. (Tincture Diluted 1:10)
Experiment 3	72%	11.7 cc. (Tincture Diluted 1:10)
Experiment 4	71%	13.1 cc. (Tincture Diluted 1:10)
Experiment 5	73%	10.1 cc. (Tincture Diluted 1:10)

On examining Table No. I, a close agreement is noted between the plant and the cat methods. As a matter of fact the data obtained by the animal method are much more liable to wide variations than those obtained with an average of ten seedlings or more. The authors have found, as well as all other workers with the cat method, that sometimes quite uniform results may be obtained, but at other times and with other tinctures no uniformity in the cat units could be obtained at all. Thus for instance, in case of one of the tinctures studied (No. 3)

no definite information at all could be obtained by the animal method, because of the very different results obtained in each cat experiment as will be seen in Table No. II. It will be noted that the figures obtained from five experiments with plants were practically identical, while the toxicity given by five cat experiments was very different in each case. What the explanation for such great variations may be is still problematical. In Curve No. 2 are plotted the toxicity units obtained with various percentages of the same Tincture No. VIII. On comparing this curve with Curve No. 1 expressing a similar relationship between toxicity and concentration of digitalis as determined by the plant method it will be noted again that the cat curve is not as uniform as the plant curve.

COMMENT.

Although such curves as have been described may be useful in determining the potency of digitalis tincture for animals in terms of their toxicity for plants, the greatest usefulness of the phytopharmacological method of study is in research work, for the comparison of a large number of tincture samples. Thus for instance this phytopharmacological method enables one to compare easily the effect produced on the keeping qualities of digitalis preparations by various deleterious agents such as heat, light and other radiations; and indeed the authors have employed this method extensively in their study of the deterioration of digitalis published elsewhere. It has been not at all unusual in such work for the authors to test twelve or fifteen samples of digitalis tincture on ten seedlings each at one and the same time. It is evident that to make such a comparative examination of a large number of digitalis samples by means of cats using at least two or three animals for each preparation would involve an enormous expenditure of energy, quite a considerable cost, and a very much longer period of time. Furthermore, the plant experiments require a much smaller amount of any given preparation than the cat experiments. One cc. of a tincture and even less are quite sufficient for making a test on ten or more seedlings, whereas at least five cc. and usually more of the tincture are necessary for a single cat experiment.

Another and very interesting feature of the phytopharmacological examination of digitalis preparations must be mentioned in this place. Important work has in the past few years been published by various investigators concerning the influence of electrolytes on cardiac response. Thus it has been shown that the "pacemaker" may be shifted at will by changes in the Ca- and K-ion ratio (Sakai (36), Daly and Clark (37), Kolm and Pick (38)). The ratio of potassium and calcium ions in the blood is of great importance also in relation to the action of digitalis bodies. This has been emphasized especially by Loewe (39), Pick (40), and Horst-Meyer (41) and others. Briefly it may be stated that an increase in calcium tends to potentiate the toxicity of digitalis substances for the mammalian heart, causing a systolic stand-still; while an increase in potassium, as is well known, tends to paralyze the heart muscle and bring a stand-still in diastole. Indeed, it is possible to render a given preparation of digitalis much more toxic by adding a certain amount of calcium to it. Thus, for instance, the authors by adding small quantities of calcium chloride to Tincture No. VIII increased the toxicity from 9.8 cc. per kilo to 8.2 cc. per kilo weight of cat. Such an adulteration of digitalis preparations can be easily detected by the plant method.

The authors have studied the effects of increasing and decreasing potassium and calcium ions in Shive solution on the growth of *Lupinus albus* seedlings, and found that increase in the calcium produces an improvement in the growth of the plants, and in the same way slight increases in potassium ions in Shive solution also improve the growth of the seedlings. Additions of small quantities of calcium or potassium chloride, respectively, to tincture of digitalis were also found not to increase their toxicity for plants and, indeed, if anything to lessen it. This reaction of the plants is diametrically the opposite from the reaction of cats to such preparations of digitalis.

SUMMARY.

1. The effect of digitalis solution was studied on the growth of seedlings of *Lupinus albus* and found to inhibit it.

2. The inhibition on the growth of the seedlings is proportional to the concentration of the digitalis solution used, so that a simple curve of relationship between growth and concentration can be constructed.

3. Such a phytotoxic curve has been calibrated in terms of cat units and has been found useful in gauging the potency of digitalis tinctures.

4. The phytotoxic test is especially useful in the comparison of different samples of digitalis tinctures in order to detect differences in potency produced by various physical and other agencies.

5. By means of the phytopharmacological examination a large number of digitalis samples can be simultaneously tested, in a short time, at a smaller cost, and with less expenditure of labor than the cat method; and is superior to the latter in showing less variation and in certain other respects, notably in regard to the relationship of digitalis principals to potassium and calcium ions.

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THE DETERMINATION OF SMALL QUANTITIES OF BISMUTH IN TISSUE, EXCRETA, BLOOD AND BONE.

BY JAMES A. SULTZABERGER.

There are a number of methods for the determination of bismuth in small quantities. These methods are mostly based on the determinations in colloidal solutions by using an alkaloid with the sulphide, the oxide or some other form of bismuth. As the accuracy of methods based upon colloidal suspensions is questionable, they are not to be recommended.

In 1887, Stone[1] found that when small quantities of bismuth in solution were treated with an excess of potassium iodide in the presence of sulphuric acid and sulphurous acid, a characteristic greenish yellow color was obtained. This was due to the formation of a complex bismuth potassium iodide having the formula $BiI_3.2KI.4H_2O$. Rowell[2] made use of this compound in analyzing ores and alloys containing copper, lead, etc., for small quantities of bismuth. He found that alkalis in excess, ammonium acetate, hydrochloric acid and chlorides bleached the color. The heavy metals such as arsenic, lead and copper form color and must be removed. Iron in the absence of sulfurous acid liberates free iodine.

C. A. Hill[3] recently in analyzing urine digested the organic matter by a method of wet ignition using nitric acid (Sp. gr. 1.42). He developed the color for comparison, however, by the aid of an alkaloid. Caille and Viel[4] in determining small quantities of antimony and bismuth ignited their samples in a muffle furnace.

Soon after the method to be described in this paper had been perfected, C. S. Leonard[5] published a method in which samples were digested by heating in a

[1] F. B. Stone, *J. Soc. Chem. Ind.*, 6, 416 (1887).
[2] H. W. Rowell, *Ibid.*, 27, 102 (1908).
[3] C. A. Hill, *Lancet*, 209, Part 2, 1281 (1925).
[4] Caille and Viel, *Compt. rend.*, 176, 1759–1761 (1925).
[5] C. S. Leonard, *J. Pharmacol.*, 28, Part 2, 81 (1926).

flask with concentrated nitric and sulphuric acids (20:1). The readings were made from bismuth potassium iodide solutions acidified with sulphuric acid instead of hydrochloric acid. He also reiterated Rowell's statement that chlorides and hydrochloric acid affect the color.

Autenreith and Meyer[1] digested organic matter by the use of potassium chlorate and hydrochloric acid. Bismuth was precipitated in the usual way and compared in bismuth potassium iodide solution acidified with hydrochloric acid.

Studies in this laboratory[2] on the Absorption, Distribution and Elimination of Bismuth yielded samples for the determination of bismuth in amounts from 50 mg. to nil. The method first adopted in the analysis of these samples was that of Autenreith and Meyer.[1] This method proved unsatisfactory because too much time was required for digestion and precipitation. Small amounts of iron in the reagents also caused trouble after the precipitation of bismuth, by constantly liberating free iodine which could not be all removed with chloroform. As no other satisfactory method was found in the literature, it was deemed advisable to work out the details of a satisfactory method, particularly in regard to a simplified procedure of digestion.

PROCEDURE.

Ten to 50 Gm. of tissue or feces were placed in a small porcelain dish, moistened with concentrated nitric acid and warmed over night on a steam-heated sand bath. The sample was then ignited over a Bunsen burner with a low flame which was gradually increased to its full intensity for three or four hours. If the residue still contained carbon particles, nitric acid was added to the cooled dish and heated until the brown fumes were expelled. This operation was repeated until all the carbon was digested.

Urine was digested in samples of not less than 25 cc., in 50-cc. Pyrex beakers in the same manner. Larger samples were evaporated to dryness, treated with nitric acid and transferred to 50-cc. beakers. Most urine residues turned white after igniting only a short time.

The ignited residues were boiled with concentrated hydrochloric acid, evaporated to dryness, treated with 0.5 cc. of concentrated hydrochloric acid and 5 cc. of water, filtered and diluted to about 15 cc. in a graduated cylinder. To each cylinder 0.75 cc. of 25 per cent potassium iodide and 0.5 cc. of 1 per cent sodium bisulphite were added. The solution was diluted to exactly 20 cc. and compared with a standard in the Duboscq colorimeter.

The standard was made from a bismuth nitrate solution containing 0.05 mg. of bismuth per cc. In the test 2 cc. or 0.1 mg. was usually taken, acidified with 0.5 cc. of concentrated hydrochloric acid and diluted to 15 cc. Potassium iodide and sodium bisulphite were added and the solution was diluted to 20 cc. as in the unknown. If the color in the unknown indicated more than 0.1 mg., an aliquot of the unknown was diluted and compared using the same concentrations of reagents as in the standard. If the color in the unknown indicated less than 0.1 mg., a standard was made to match the unknown as nearly as possible.

In the digestion of bone, the precipitation of the metal with hydrogen sulphide

[1] Autenreith and Meyer, *Münch. med. Wochschr.*, 71, 601 (1924).

[2] O. M. Gruhzit, F. H. Tendick and J. A. Sultzaberger, Parts I and II, *Am. J. Syphilis*, Vol. 11 (January 1927).

was necessary because of the excess amount of salts present. Nitric acid was added after ignition to dissolve most of the salts. The undigested carbon particles were filtered off, digested separately and added to the nitric acid solution which was evaporated to dryness. The bismuth was precipitated from hydrochloric acid solution in the ordinary way with hydrogen sulphide. The precipitate was filtered on a Gooch, dissolved in concentrated hydrochloric acid, filtered to remove the asbestos and the bismuth was determined as stated above.

In the present work, it was found that sodium chloride by itself does bleach the bismuth potassium iodide color to a marked degree, but with the addition of hydrochloric acid the color returns and no difference could be detected between solutions of bismuth potassium iodide containing sodium chloride and hydrochloric acid, and hydrochloric acid alone. In sulphuric acid solution the color was very slightly more intense but as hydrochloric acid was added to all the standards, the same conditions were maintained in the standard as in the unknown.

Blanks run by the above method were water white when all the reagents were added.

The use of the muffle furnace was eliminated by the following tests. Known quantities of bismuth were added to six samples of meat weighing 10 Gm. each. Three samples were ignited over Bunsen burners and three in the muffle furnace.

TABLE I.

IGNITED OVER BUNSEN BURNERS.

Bi added in mg.	Bi found in mg.	Per cent recovered.
0.2	0.196	98
0.4	0.365	91
0.8	0.770	96

IGNITED IN MUFFLE FURNACE.

Bi added in mg.	Bi found in mg.	Per cent recovered.
0.2	0.960	48
0.4	0.235	59
0.8	0.455	57

No tests were made to determine whether the metal was fused into the porcelain dishes or was volatilized.

VERIFICATION OF THE METHOD.

Various quantities of bismuth, which were unknown to the author, were added to four samples of urine containing 25 cc. and to four samples of meat weighing 10 Gm. each.

TABLE II.

URINE.

Bi added in mg.	Bi found in mg.	Per cent recovered.
2.0	2.0	100
0.5	0.44	88
0.75	0.73	97
0.15	0.12	80

MEAT.

Bi added in mg.	Bi found in mg.	Per cent recovered.
0.50	0.48	92
0.30	0.26	87
0.75	0.67	89
0.15	0.15	100

Known amounts of bismuth were added to 25 Gm. samples of fresh ground bone. As certain animal studies gave evidence of bismuth in the bones, it was deemed advisable to make these tests.

TABLE III.

Bi added in mg.	Bi found in mg.	Per cent recovered.
0.2	0.200	100
0.2	0.188	94

Two small young rats were injected with amounts of bismuth unknown to the analyst, and killed immediately. Two more rats were killed and known amounts of bismuth solution were added to the dishes.

TABLE IV.

Bi injected in mg.	Bi found in mg.	Per cent recovered.
1.0	1.000	100
1.5	1.492	99
Bi added in mg.	**Bi found in mg.**	**Per cent recovered.**
0.5	0.482	96
1.0	1.000	100

SUMMARY.

A method is described for the rapid determination of small quantities of bismuth in body tissues, excreta, blood and bone. The advantages of this method are as follows:

1. Digestion is accomplished by dry ashing over the Bunsen burner in Pyrex beakers and porcelain dishes. It has been shown that none of the bismuth is lost at the temperature of the Bunsen burner while the carbon is, of course, oxidized rapidly.

2. No precipitation is necessary, except in analyzing bone where the amount of salts is too great to be dissolved in a small quantity of solution.

3. Chlorides do not interfere with the accuracy of the method.

4. The bismuth is determined colorimetrically in hydrochloric acid solution with an excess of potassium iodide. The liberation of free iodine by oxidation in the presence of iron is prevented by the addition of sodium bisulphite to the acid solution.

ARTICLE NO. 38,
CHEMICAL RESEARCH DEPT.,
PARKE, DAVIS AND CO.

WASICKY'S REAGENT FOR THE IDENTIFICATION OF ALKALOIDS.

Wasicky's reagent is prepared by dissolving para-aminodimethylbenzaldehyde, 6 Gm. in strong H_2SO_4, 2 Gm., and adding 0.04 Gm. of water. The author enumerates the color reactions obtained with a number of alkaloids, in the cold, on warming and on diluting the reaction mixture with water. Several of these are characteristic, such as those of the ergot alkaloids. The reagent also serves to distinguish sabadine from veratrine and morphine or codeine from the other opium alkaloids. It also serves to distinguish the three chief quebracho alkaloids, to identify ibogaine and yohimbine, and esters of tropic or taropic acids. He does not agree with Field Stedman that the reaction obtained with it with quebrachamine is due to an indole group in that base, since he finds that pure indole does not give the same reaction.—Raymond Hamet (*Bull. sci. pharmacol.*, 447 (1926); through *Pharm. J.* (Feb. 12, 1927)).

A REVISION OF THE PENTANOLS.*

BY S. M. GORDON AND EDWARD KREMERS.

The special interest which the plant chemist attaches to these alcohols lies in their biochemical significance. The question is not so much one of wide distribution of amyl alcohol, valeric aldehyde and valeric acid in the plant kingdom, but which of the isomeric primary alcohols with its corresponding aldehyde and acid is thus found. Again, the principal interest lies not only in the occurrence of this group of related compounds with five carbon atoms, but in the possible genesis of compounds with ten carbon atoms that may be derived from one of the iso valeric aldehydes. The peculiar grouping of many compounds with ten carbon atoms found so widely distributed in plants is too significant to be overlooked.[1] In an attempt to make certain which of the isomeric pentanols occurs in peppermint, it was found that our knowledge of this group of alcohols was insufficient to establish the identity of the compound isolated, hence this revision.

The Pentanols.—The alcohols of the formula $C_5H_{11}OH$, known formerly as amyl alcohols, now as pentanols, exist in eight isomeric forms. Of these three contain an asymmetric carbon atom, hence the number of isomers is thus theoretically raised to eleven.

Historical Introduction.—The formula $C_5H_{12}O$ was assigned to the amyl alcohol of fermentation by Dumas in 1834 (*Ann.*, 13, 80), though Scheele had obtained such a product in an impure state as early as 1785 (*Crell's Ann.* (1), 61, 1785). Its analogy with ethyl alcohol was first pointed out by Cahours in 1839 (*Ann.*, 30, 288; *Ibid.*, 35, 312 (1840); *Ibid.*, 37, 164 (1841)), who also assigned to it the name amyl alcohol, because of its supposed relation to starch. This was confirmed by Dumas and Stas in 1840 (*Ann.*, 35, 143) and by others. The optical behavior of amyl alcohol of fermentation was first studied by Biot (*Compt. rend.*, 41, 296 (1855)) and later more particularly by Pasteur (*Ann. de Chem.*, 96, 255 (1855)), Le Bel (*Bull. de la Soc. Chem.* (2), 21, 542 (1874) and 25, 545 (1876)), and Marckwald (*Ber.*, 34, 479 (1901); 35, 1596 (1902), and *Ber.*, 37, 1049 (1904)).

Thus there were foreshadowed, firstly the position of amyl alcohol in the homologous series of alcohols of which ethyl alcohol was the principal member; and secondly, the isomerism of the alcohols $C_5H_{11}OH$ (*Limpricht, Org. Chem.*, p. 125). Kolbe's carbinol hypothesis had already revealed the possibility of primary, secondary and tertiary alcohols (*Kolbe's Lehrbuch*, p. 412 (1856)). These then found complete structural expression in Kekule's structural theory (*Kekule, Lehrbuch*, p. 433 (1861)). From now on it became a question of identifying alcohols $C_5H_{11}OH$, already in hand, with the hypothetical formulas of the carbinol and structural theories, seeking the remaining ones and to prove the correctness of the several assertions by synthesis.

Isomerism.—The isomeric alcohols of the formula $C_5H_{11}OH$ may be arrived at in one of the several ways.

I. According to Kolbe's carbinol hypothesis:

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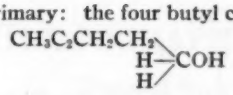
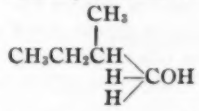
* Read before Scientific Section, A. PH. A., Philadelphia meeting, 1926.

[1] R. E. Kremers, *J. Biol. Chem.*, 50, p. 31 (1923).

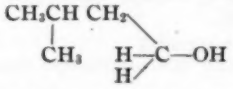
A. Primary: the four butyl carbinols:

a. 

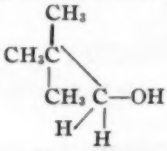
Primary normal butyl carbinol

b. 

Secondary normal butyl carbinol

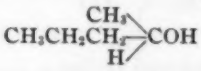
c. 

Primary isobutyl carbinol

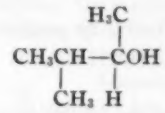
d. 

Tertiary isobutyl carbinol

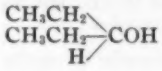
B. Secondary: the two methyl propyl carbinols:



Methyl *p*-propyl carbinol

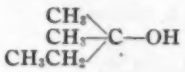


Methyl *s*-propyl carbinol



Diethyl carbinol

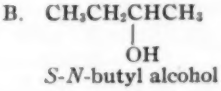
C. Tertiary: Dimethyl ethyl carbinol:

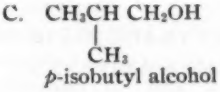


II. The methyl homologues of the butyl alcohols.

Butyl alcohols

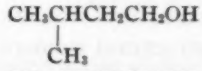
A. $CH_3CH_2CH_2CH_2OH$
p-*n*-butyl alcohol

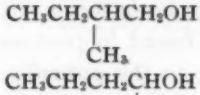
B. 
S-*N*-butyl alcohol

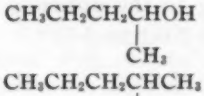
C. 
p-isobutyl alcohol

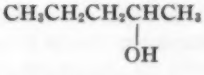
Pentyl alcohols

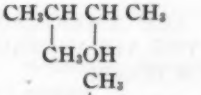
1. $CH_3CH_2CH_2CH_2CH_2OH$

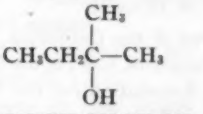
2. 

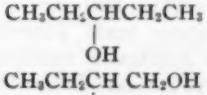
3. 

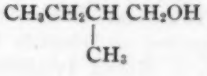
4. 

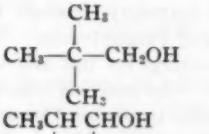
1.  = A, 4

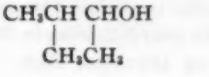
2. 

3. 

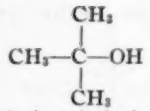
4. 

1.  = A, 3

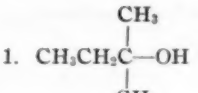
2. 

3.  = B, 2

D.



t-isobutyl alcohol



= B, 3

III. In accordance with the Geneva Congress Nomenclature.

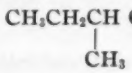
A. Alcohols referable to pentane

$CH_3CH_2CH_2CH_2CH_2OH$
Pentanol-1

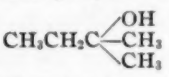
$CH_3CH_2CH_2CHOHCH_3$
Pentanol-2

$CH_3CH_2CHOH\ CH_2CH_3$
Pentanol-3

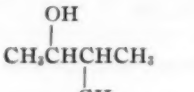
B. Alcohols referable to methyl butane



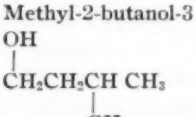
Methyl 2, butanol-1



Methyl 2, butanol-2

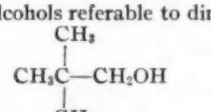


Methyl-2-butanol-3



Methyl-2-butanol-4

C. Alcohols referable to dimethyl propane



Dimethyl-2,2-propanol-1

No matter by which method the isomeric alcohols $C_5H_{11}OH$ may be derived, the number of structural isomers is the same, *viz.*, 8. It will be seen, however, that three of these structural isomers have an asymmetric carbon atom, hence exist in two optically isomeric forms, *viz.*, dextro and laevo gyrate. The asymmetric carbon atoms are found in pentanol 2, methyl-2-butanol-3 and methyl-2 butanol-1. When referring to the optically active amyl alcohol textbook writers commonly refer to methyl-2 butanol-1.

(*To be continued*)

OFFICERS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Arthur A. Noyes of the California Institute of Technology, Pasadena, Cal., is the President of the American Association for the Advancement of Science. The Secretary is Burton E. Livingston whose home address is c/o The Smithsonian Institution Building, Washington, D. C. The general officers of the Committee of One Hundred on Scientific Research are Chairman A. A. Noyes, President of the Association, and Secretary, Rodney H. True, of the University of Pennsylvania. The dates of the annual meetings for this and next year have been fixed. The meeting this year will be held at Nashville beginning December 26th and the one of the year following in New York City beginning on December 28th.

LIMITATION OF PHARMACISTS IN TURKEY.

The proposed pharmacy law of Turkey will necessitate the closing of about three hundred businesses and is seriously disturbing the pharmacists of that country, most of whom are opposing the provision which limits the number of stores.

INDIA'S EXPORT TRADE IN CINCHONA, NUX VOMICA AND SENNA.

Exports of nux vomica and senna, from India, increased during the first six months of last year. However, shipments of cinchona during the same period were very much less than during the previous year; namely, 410,528 against 456,069 pounds.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

APPARATUS AND MANIPULATIONS.

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Anon
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IMPORT AND EXPORT TRADE OF U. S. IN DRUGS, CHEMICALS, ETC.

According to the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce, the U. S. exports of chemicals and related products showed an increase, and the imports a decrease during the first nine months of 1926, as compared with the corresponding periods of 1925. During this period of 1926 the exports had a total value of $91,817,000 and the imports $103,993,000, while in 1925 the exports had a value of $86,432,000 and the imports $108,939,000. The exports of crude drugs, vegetable oils, dyeing and tanning materials totaled, for the first nine months of 1926, $7,360,424, as against $7,018,972 for the same period of 1925, while the imports of drugs, herbs, leaves, roots, etc., totaled $6,556,330, as against $5,553,694 for the same period of 1925; of essential and distilled oils, $5,124,585, as against $4,650,905; and of dyeing and tanning materials, $6,185,965, as against $6,355,765.

AVIATION MEDICINE.

Georgetown is the first medical school in the country to include a course in aviation medicine in its curriculum. The lectures will be given by Dr. Louis H. Bauer, Medical Director of the Aeronautics Branch, Department of Commerce, who is in charge of the medical examinations of pilots applying for Federal licenses.

Dr. George M. Kober, Dean of the Medical School at Georgetown, is directly responsible for approval of this addition to the present subjects of the institution.

THE U. S. P. X NITRATE TEST AS APPLIED TO SOLUTION FERRIC CHLORIDE.*

BY M. W. CAREY AND R. E. SCHOETZOW.

During the course of an examination of a sample of solution iron chloride, the prescribed U. S. P. X Test for nitrates using ferrous sulphate and sulphuric acid was used and produced a brownish ring at the junction of the two liquids.

When the same sample was subjected to the nitrate test, given under potassium iodide in the U. S. P. X, wherein solution of sodium hydroxide and metallic aluminum are used, no test for nitrates was indicated.

Other radicals than nitrates may give a reaction in the above-named ring test and in order to verify the results obtained in the above aluminum sodium hydroxide test, two solutions of ferric chloride were prepared in neither of which any nitric acid was used. In one case the mixture of ferrous chloride and hydrochloric acid was oxidized by adding hydrogen peroxide and heating; in the other, gases which are generated by the action of hydrochloric acid on potassium chlorate were used to oxidize the ferrous chloride and hydrochloric acid. In the preparation of these solutions care was taken to dispel all excess chlorine or peroxides by heating for two hours on the water-bath.

These ferric chlorides were tested according to the U. S. P. "ring" test and brown "rings" were obtained in each case. This seemed to prove that the U. S. P. X nitrate test was caused by something besides nitrate since we had not used any nitric acid in the manufacture. To make sure we applied the test to each of the constituents of the two solutions we made. Negative tests resulted in each instance. But, when we applied the test to a mixture of the hydrochloric acid and the oxidizing agent (it did not matter whether it was the peroxide or the chlorine gases) a brown ring was formed.

These experiments show that if iron chloride yields a positive U. S. P. X nitrate test it may not be due to nitrate, but to the presence of hydrochloric acid and an oxidizing agent.

ANALYTICAL LABORATORIES,
E. R. SQUIBB & SONS.

WHAT DRUGGISTS ASK AN EDITOR.†

BY WALTER M. CHASE.[1]

During the past few days we have heard more or less about Dr. Charter's report on "What the Druggist Should Know." The Commonwealth investigation has been a most complete one, involving several years of intensive study, and its findings will be of incalculable value and interest to everyone connected with the profession of pharmacy.

However, there is sometimes a considerable difference between what a man should know and what he wants to know, and it was with the idea of determining what things fall into the latter classification that I started to assemble the material that forms the basis of this paper.

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* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

† Read before Section on Commercial Interests, A. PH. A., Philadelphia meeting, 1926.

[1] Formerly Assistant Editor, *Bulletin of Pharmacy*, Detroit, Mich.

The magazine with which I am connected, in common with most of the others in the same field, conducts what is known as an "Answers to Queries" department—a section of the journal wherein is listed some of the questions asked by readers and where answers to these questions are given. The primary object of such a department is to supply information on subjects of pharmaceutical interest, the assumption being that the solution of a problem which has troubled one druggist will also interest others.

It might be assumed that the questions which reach us in this way are concerned mainly with matters relating to the prescription department. Such is not the case. I am going to cite an even hundred of them. In selecting the queries I took them as they came—one after another the way each day's mail brought them in—and only 35 per cent involved what might be termed straight pharmaceutical problems. The remaining 65 were on entirely different matters. Nineteen concerned themselves with toilet goods, eighteen were devoted to commercial problems, six related to the soda fountain, four took up educational matters, thirteen were on subjects that would seem to be entirely divorced from the retail drug business and five refused absolutely to fall into any classification that I could devise.

It is these last five that I propose to take up first. They illustrate nicely the wide diversity of interests that a druggist may have and they also serve to show why all questions that are put up to an editor cannot be answered through the pages of his magazine.

The first one of the five was from a druggist in the South who has been on our subscription list for many years and with whom we have had considerable correspondence. He writes: "My son left home about a month ago. He had tired of the long hours in the store with me, and said he was going to Detroit to get a job in an automobile factory. We have not heard from him since he left us. Do you suppose, by any chance, that you can locate him?"

Rather a big order, was it not?

As luck would have it, we were able to help. The boy, himself a reader of our pages, had called on us only a few days before to see if we would give him a reference for a drug-store position. He had found factory work not to his liking and wanted to get back into the drug business. We reached the boy on the phone at the store where he had secured employment, read his father's letter to him, and he promised to write home that very night.

Unclassified question number two came from a man who wrote: "I have been in the drug business for ten years and think it about time that I join one of the national pharmaceutical associations. Would I get more benefit out of a membership in the AMERICAN PHARMACEUTICAL ASSOCIATION or in the National Association of Retail Druggists, and why?"

It required three typewritten pages to answer that query.

Question number three came from a reader who asked: "What are the three most important problems in pharmacy to-day? Also tell me how they may be solved. A stamp for reply is enclosed."

We answered his letter.

Number four is a proposition that we get in slightly modified form throughout the year and a number of times a year. There seems to be no closed season for it.

Here it is: "I am a member of our local Rotary Club (or Kiwanis or Lions) and next month I am scheduled to deliver a talk on the history of pharmacy at one of our noon luncheons. Please outline for me the progress of our calling since its early beginnings."

We are able to handle a request of this kind by referring the druggist to several such talks that we have printed in recent years.

Somewhat along similar lines, but of a type rather more difficult to answer satisfactorily, was the fifth unclassified query. It read: "What can you tell me of the histology and pharmacology of the drugs used by the Indians prior to the coming of Columbus? I am a student at the "So and So" College of Pharmacy and have chosen this subject for my thesis."

We are generally able to refer the makers of such requests to sources where information may be obtainable, but, if there are any faculty members in the room now, I hope they will take the hint and persuade their students that an acceptable thesis doesn't necessarily mean a subject which requires a lifetime of study.

Swinging back now to the thirty-five queries concerned with pharmaceutical problems, I find that eight of them involved incompatabilities of various kinds. These are questions that a pharmaceutical editor might be expected to receive and we try to answer them fully and explicitly. Here are some typical questions in this class: Why a color change when syrup of ipecac and guiacol are mixed? What happens when aspirin and sodium bicarbonate are mixed? What is the cause of discoloration in capsules of sodium iodide and salol? What reaction occurs when zinc sulphate, sulphurated potassa and rose water are mixed? Should adrenalin and argyrol mixtures be dispensed? What causes a precipitate in a mixture of ammonium acetate, spirit of niter and syrup of cocillana? What causes a red color in a solution of salicylic acid and bicarbonate of soda? This last question, by the way, was sent by a subscriber who lives in Egypt.

Another group of seven in this same bunch of thirty-five is made up of questions which we answer with a form letter. The inquirer asks: How can I make Sloan's Liniment, or Red Pepper Rub, or White Wizard Oil, or Flit, or Petrolagar, or any one of the other hundreds of proprietary preparations on the market. We frankly tell the makers of such requests that they cannot do what they have in mind—that Sloan's Liniment or Flit is a proprietary product the composition of which is known only to the maker and that it is contrary to law to attempt to appropriate another man's property.

Of course, if the inquirer asks for the formula of a product that will serve the same purpose as Sloan's Liniment, it puts a different face on the matter. We then, if we are able to do so, supply a working formula together with a notation to the effect that we have no knowledge of the composition of the article in question and that the formula we are supplying is simply to serve a similar purpose.

Formulas for preparations from foreign pharmacopœias and preparations called for under little-known synonyms are frequently requested by readers. In the group of thirty-five now under discussion were requests for Imperial Drink, a formula for which was located in Squire's Companion to the British Pharmacopœia; elixir elegans, which was found to be a synonym for simple elixir; kinderpulver, the German name for compound powder of rhubarb: and unguentum

gallæ comp., which was one doctor's way of specifying gall and opium ointment.

How to make a reconstructive tonic, Benedict's solution, effervescent salts, Haines solution, pills of cod-liver oil, and a liniment especially suitable for football players were among the questions asked. Still others were how to medicate alcohol so that it might be sold legally (sometimes, incidentally, we get the reverse of this question), what the difference is between sodium dimethyl arsenate and sodium methyl arsenate, the cause of a precipitate of Fischer's solutions, how to purify kerosene, the trade name for pentaiodomethylenedisal, and whether or not ether is developed in the manufacture of glycerite of tannic acid.

Three questions in this group involved the manufacture of percentage solutions, a procedure which our experience indicates seems to cause a great deal of trouble. One man wanted to know how to make 5 per cent phenol from 90 per cent; another how much 40 per cent formaldehyde to use in making a pint of ten per cent solution; a third how much Epsom salt would be required for a quart of saturated solution.

An unusual request was from a store in Milwaukee which sent us two Danish prescriptions originally written by a doctor in Copenhagen. We succeeded in getting translations of both.

"How much does a teaspoonful hold?" asked one worried druggist who explained that one of his physicians wrote heroic doses and that he, the druggist, was afraid patients might get an overdose if the teaspoons they used held more than 60 minims. We suggested a graduated medicine glass with each such prescription, for investigations have shown that the average household teaspoon frequently has a capacity of as much as ninety minims.

"What do you consider a fair price for this prescription?" was a question that came up only once in my list of thirty-five, but it is one that we get nearly every week. We answer this query by a letter explaining several pricing systems that are in common use.

The group next largest to the one on straight pharmaceutical problems is that which concerns toilet goods. Nineteen per cent of the questions were of this character.

Starting at the top, eight of the nineteen were about the hair. How can straight hair be made curly? How can curly hair be made straight? What will dye gray hair brown? What will turn dark hair gray?

Rather contrasty, don't you think?

A fifth man wanted a formula for a preparation to keep the hair in place. A sixth stated he had prepared a liquid shampoo that had been approved by the testing department of a leading women's magazine, but that a sediment developed after the shampoo stood in bottles for a while. Would we tell him how to prevent it? A seventh wanted to know what he could use to color a hair oil red.

We were able to answer these questions satisfactorily—they bob up frequently—but the eighth man had us stumped. He asked for a "razorless shave powder," one that would remove whiskers promptly without irritation, and he wanted three strengths of powder—one for tough beards, one for medium beards and one for boys just beginning to shave.

Other requests in this group included a skin bleach for negroes, a way to make quince seed lotion white, a liquid cold cream milky in color and readily absorbed

by the skin, a perfume oil that would cover up ten per cent of spirit of camphor in a toilet lotion, a powder for holding false teeth in place, a moisture-proof rouge, a peppermint-flavored tooth paste and the title of a good book on cosmetics.

The eighteen questions on commercial problems were widely diversified and showed that the average retail druggist has plenty to occupy his mind.

One of the most interesting, perhaps, came to us in the form of a night letter from Texas. This man had had his store building sold out from under him and had to seek a new location. He was offered one in a downtown hotel then under process of construction and the landlord wanted 10 per cent of the store's receipts for the first year as rent. From previous correspondence with this man we were familiar with a number of details of his business and he felt that we were in a position to advise him as to whether or not he should sign the lease. After an exchange of telegrams we advised against it. He later secured another location at a set figure, which was about equal to six per cent of his sales. He reported to us, after a month in the new location, that the prospects were very favorable indeed and that he expected, if business kept up the way it started, to cut his rent to about five per cent.

We are quite frequently consulted on problems similar to this one, as two more of the eighteen questions will show. One read: "Is a neighborhood or transient location better for the man just starting in business? The other: "Does a neighborhood store show a bigger margin of net profit than a downtown one?" Questions like these, of course, cannot be answered specifically.

A question that always is sure to bob up and that we find twice in our list of eighteen is: "How should I go about it to put a preparation of my own over in a big way?" A running mate to this one is: "How can I trade-mark a product of my own so that nobody can make one like it?"

Right here I want to digress a little and say that trade-mark laws seem to be a mystery to the average retailer and especially to the man who is desirous of branching out into the manufacturing field. He seems to think that once he has secured a trade-mark, his troubles are over. Which, of course, is far from the facts in the case.

Questions on store expense come to us regularly. "What is the average expense percentage for a drug store? How much pay should a registered clerk receive? What percentage of my sales should I spend for advertising? What proportions of a clerk's sales is represented by his salary? Is wrapping paper an item of expense or should it be charged against the cost of goods?" All these were among the questions asked.

"Where can I find a syndicate that will write ads specially for my store at a cost not to exceed $5 a month?" was a staggerer. We couldn't answer it.

Neither could we give a direct reply to this one: "I have had four years' experience in the drug business and will come to Detroit to work for $60 a week. Please let me know of a good firm that wants such a man."

Three of the eighteen commercial questions asked for the names of makers of commodities. One man asked to know where to buy Yoghurt, another wanted rubber aprons and a third wanted snow-white petrolatum that would look like cold cream.

And, finally, two queries from advertising agencies. One asked us to give

an estimate of the number of crutches that were sold annually by drug stores and the other wanted our opinion as to the advisability of putting another 50-cent tooth paste on the market.

The six questions in the soda fountain field covered a wide spread. "What kind of an electrically-refrigerated fountain shall I buy?" was the most difficult to answer. An easier request was for the name of a concern that makes an ice-cream dipper that will dip out a pint at a time.

Insuring cleanliness at the fountain was responsible for two of the questions: "How can marble be cleaned?" and "What will polish metal parts?"

Questioner number five wanted to know how to make marshmallow topping.

The sixth man wanted to know where he could obtain a list of 500 fountain owners operating in Pennsylvania.

Two of the four questions along educational lines involved the matter of reciprocal registrations. One man asked if New York reciprocated with Florida and the other if a Canadian pharmacist could obtain reciprocal registration in the United States. The third man wanted to learn the entrance requirements for Michigan pharmacy colleges and the fourth, a student, asked to be supplied with a list of books for supplementary reading.

"How can I make a still from an orangeade cooler?" was the first of the thirteen questions on lines that may be considered foreign to the drug business. "How can I make a varnish for glass letters from silicate of soda?" was the second poser.

Other things that druggists wanted to know were how to prevent streaking when dipping chocolates, how to permanently dye sand for use on outside signs, how to make paint remover for automobiles, how to frost flint glass, how to dye flowers, how to make eye-glass cleaners, how to restore hectograph pads, how to resilver mirrors, how to prepare anti-freeze from petrolatum and how to make chewing gum.

And so it goes. The queries we get help make life more enjoyable. If we could remember all we have to look up we'd know a lot.

HISTORICAL NOTES.

John Tradescant, the elder, gave to England the nucleus of its first museum and his son, in order to contribute thereto, searched about in the swamps, forests and hills of Virginia for several years in the early part of the 17th century and is entitled to the distinction of making the first botanical and geological survey in this country. The Garden Clubs of Virginia has placed a memorial window in the old Ashmolean museum on the historic "Broad," Oxford.

We find the name of Tradescant associated with Virginia Spiderwort, Tradescantia virginica. This native Virginia plant became an English garden favorite and the English naturalist, James J. Walker, said of this early botanist, that "no Englishman will ever see a lilac in full flower without thinking of John Tradescant."

Radola Gajda, one-time drug clerk and soldier, has been chosen as the new Fascist II Duce of Czecho-Slovakia. Gajda was born Rudolph Geidl, son of a German family who had settled in Moravia.

M. Valeur, Assistant Professor in the Paris faculty of pharmacy and head pharmacist of Paris asylums, has succeeded the late M. Lefay on the Codex Revision Committee. The next historical exhibit of the Bibliotheque Nationale will open on February 24th and will illustrate the epoch of Louis XIV and the extravagant formula of the passing of the notorious marquise de Brinvilliers, among other interesting historical documents.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

WHY I AM NOT A CUT-RATE DRUGGIST—THE OPINION OF A SUCCESSFUL RETAIL PHARMACIST.

As I look at the crowds and crowds of prosperous patrons who push their way into the stores of my cut-rate competitors, I can't help but be a little envious of the tremendous volume of business which it is very evident that they are doing. But, then, when I look at the financial reports of some of these chains of aggressive price cutters, my ardor for their volume is somewhat cooled. With all their tremendous patronage and huge volume of business the profits are astonishingly small.

In my position I can't help but hear a good deal of gossip of the drug trade. Salesmen stop in and disgustedly show me statements with overdue balances running back six months or more which they are trying desperately hard to collect from the smaller chains of stores. I am something of a "father confessor" in the retail business and I suppose that is the reason these salesmen come to me with their troubles and complaints after these unsuccessful collection trips. When reports like this drift in week after week and month after month I can't help but get the impression that a goodly number of the smaller cutters aren't in the healthy, prosperous condition that their crowded aisles and blatant windows would indicate. No sane druggist is going to pass up a two per cent cash discount if he has the money in the bank with which to pay his bills. Especially is this true with a cut-rate druggist because he, of all people, operates on the narrowest of margins in many lines and the two per cent cash discount may mean the difference between profit and loss.

It would be merely hiding my head in the sand to say that in my store I don't feel the effects of these nearby and downtown cut-rate competitors. When a woman complains that I am asking 60 cents for an article which she can buy downtown for 39 cents it is no easy matter to explain to her that 39 cents is less than my cost for the article and that any store which sells this article for 39 cents must make up this loss by exorbitant profits on the sales of other merchandise. Such an explanation, to say the least, is not convincing to a woman unfamiliar

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with business methods and selling costs and it smacks of knocking and petty jealousy on my part.

The facts of the matter are, it seems to me, that the cut-rate merchants are having no trouble selling a lot of their loss leaders at the prices for which they offer them, with resulting disorganizing influences upon retail druggists, like myself, who are trying to sell this merchandise at a price which yields a legitimate profit.

The real trouble of these cut-rate merchants to-day seems to be that they can't sell enough of their long-profit merchandise to make up for their lost profits on the popular merchandise which they sell at a loss.

There seem to be a number of reasons for this. The long-profit merchandise is, by its very nature, merchandise which is less desirable and usually a slower seller than the cut-price leaders. More than that, people are becoming more and more aware every day of the principle upon which these cut-price stores operate. They wisely buy their requirements of well known and standard goods at the stores which offer them at ridiculously low prices, but when they need a prescription filled or want to buy some article of non-standard price and quality they come to a store, such as mine, which has a long established reputation for fair and honorable dealing.

It is easy to see what happens to the cut-rate store when instances of this kind occur by the hundreds every day. They do a huge volume of business and get a tremendously rapid turnover but all that this huge volume and rapid turnover results in is a multiplication of losses. Naturally, the cutter tries to earn profits by pushing long-profit goods whenever possible; but the opportunities for such pushing become increasingly difficult as people become more and more familiar with values. What is more, the amount of sales effort required to sell unknown goods is tremendous. A piano store or a second-hand automobile emporium can afford to hire people capable of such salesmanship, but in a drug store, with individual sales averaging from 40 to 75 cents, such powerful and costly selling effort can't possibly be profitable—the individual sales possibilities are too small.

In my own business, I don't believe my volume is one-third that of a busy cut-rate store a block away. On the other hand, I have every reason to believe that my profits last year were no less than ten times as large as those of my hustling competitor. You may wonder how this is possible.

Everything in my store from biologicals to sodas is priced at a figure which I anticipate from past experience will yield a legitimate profit and no more. The result is that no matter what I sell—be it a prescription or a box of candy—I am assured of a profit, always a small profit, to be sure. If every individual article in the store is sold at a profit, it stands to reason that the whole store can't help but be profitable.

Contrast my situation with that of my aggressive price-cutting competitor. Some of his goods are sold at prices which obviously result in losses. On the other hand, a lot of other articles he handles are priced at figures which anyone can tell must yield enormous profits. Imagine, for instance, ordinary 3-ounce mixtures priced at $1.25.

But even with his store packed full of hundreds of items which, if sold, yield

long profits, the proprietor of this cut-rate store never knows whether his year's operations will result in a profit or a loss. It always is a race to see if the cut-price loss leaders outsell the long-profit goods. If they do, the business operates at a loss. Only if the long-profit merchandise outsells the loss leaders can this store possibly earn a profit.

As I said before, the greater difficulty of selling unknown goods and the increasing wariness of people in buying non-standard goods in cut-price rate stores make it steadily more difficult for the cut-rate store to sell the quantities of long-profit merchandise, which it must do, if the whole store is to be profitable. As my suspicions along these lines are confirmed from time to time by trustworthy information I receive from confidential sources, I feel more and more assured that my plan of legitimate prices and a legitimate profit on each and every article in the store is the sanest and most sensible way to assure and protect profits in these days of strenuous competition.

COÖPERATING WITH COMPETITORS.

In days gone by, many and many a druggist felt that he would commit a serious social and business error if he were to so much as nod at his competitors. Competitors were arch-enemies whose every act was to be regarded with the utmost suspicion and distrust. The druggist regarded every nickel that went into a competing store as money which was just as good as stolen from his own cash drawer.

In those days there was no thought given to the idea that perhaps two drug stores and an increased number of other stores in a trading center would have the effect of increasing the drawing power of that center far beyond what it was before. That is the reason that in the largest cities department stores, specialty shops and other competing stores pack themselves into as small an area as they possibly can. Each benefits from the proximity of the other.

Aside from these considerations, however, competing drug stores which are near each other can benefit each other by many acts of courtesy and coöperation which will enable each to serve its trade better and in larger measure than if each were to pursue its course individually, absolutely ignoring the existence of the other.

The best managed store in the world occasionally will run out of a quick-selling item. The willingness of a competitor to help with the loan of a sufficient quantity of the wanted item to tide him over until a new supply can arrive assures this competitor that he can depend upon his fellow druggist for similar assistance when he needs it. If such requests are denied, the ungracious druggist may feel that patronage will come to him when his competitor doesn't have the article wanted. Some day, however, he will need something he doesn't have in stock and then his customer will have to go to the competitor to whom he refused to loan goods—so what is the gain? People as a result of such cut-throat tactics get a poor impression of drug-store service and tend to transfer their trade to other centers.

It is true that there are a few druggists who don't carry a sufficient prescription room stock. When a call comes for a rare article they send immediately to a convenient neighbor. Of course, this neighbor never can depend on such a drug-

gist for assistance in a similar need. Such coöperation is one-sided. The offending pharmacist can be penalized by charging him enough above cost to cover at least part of the expenses of carrying and handling unusual ingredients.

Competitors can coöperate successfully in many other ways. They can exchange credit information. They can warn each other of fraudulent schemes with which they may be approached. In some places agreements about opening and closing hours are in force.

Information about applicants for employment is a profitable way in which competitors can coöperate.

The point to be kept in mind is that competitors are possessed of many useful ideas and information, as well as needed merchandise, which they can exchange with each other to the benefit and profit of all.

SEASONABLE DISPLAYS FOR MARCH AND APRIL.

Face creams and lotions	Soaps and cleansers
Easter goods	Dyes
Housecleaning aids	Insecticides and germicides
Sponges and chamois	Veterinary preparations

FEDERAL COMMERCIAL EDUCATION SERVICE.

According to Earl W. Barnhardt the work of the Commercial Education Service of the Federal Board for Vocational Education includes four distinct kinds of activity:

1. Making studies, investigations and reports for use in aiding the States in giving instruction in commerce and commercial pursuits.

2. Assisting State Boards for vocational education in solving problems in administering and supervising commercial courses, and in the organization of courses of study preparing for commercial occupations.

3. Assisting national trade associations in developing educational programs for those engaged in the business represented by the associations.

4. Showing school administrators, teachers of commercial subjects and business men the need for a vocational type of commercial education.

The experience of the Federal Board has shown that an efficient vocational course, whether preparing for commercial or other vocations has the following characteristics:

"1. Be organized and conducted to develop the special knowledges, skills and attitudes needed for advantageous entrance into that particular occupation or for promotion in that occupation;

"2. Be carried on under such conditions that specific training is secured through the use of suitable instructional material and equipment coupled with efficient methods of instruction;

"3. Be taught by a teacher who has successfully followed the occupation for which the course prepares, and who has been trained to teach the essentials of that occupation;

"4. Enroll only those pupils who have the aptitudes and interest necessary for success in the particular occupation for which the course prepares, or in which they are already employed;

"5. Be based upon coöperative training relations with employers so that pupils spend part time in practical work and part time in school, receiving instruction relating to their employment;

"6. Be checked continuously by a practical system of coördination and follow-up to the end that the nature and scope of the instruction can be adjusted to meet the needs of the workers in that occupation;

"7. Be organized to meet the particular needs of office and store workers in the community where it is given so that it prepares for the particular office and store occupations in which drop-outs or graduates from the school are known to be actually employed as beginners."

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

Wilford Harrison, President, Wichita Falls, Texas. J. W. Gayle, Treasurer, Frankfort, Ky. W. P. Porterfield, Chairman of Executive Committee, Fargo, N. D. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Iowa	Montana	South Carolina
Arizona	Kansas	Nebraska	South Dakota
Arkansas	Kentucky	Nevada	Tennessee
Colorado	Louisiana	New Hampshire	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
Indiana			

APPOINTMENT OF COMMITTEES.

President Wilford Harrison has made committee appointments for the current year as follows:

LEGISLATIVE COMMITTEE.

John Culley, *Chairman*, Ogden, Utah; A. C. Taylor, 150 C St., N. E., Washington, D. C.; Samuel C. Davis, Nashville, Tenn.

SPECIAL COMMITTEE ON NATIONAL LEGISLATION.

W. T. Kerfoot, Jr., *Chairman*, 7th & L Sts., N. W., Washington, D. C.; Robt. L. Swain, 16 W. Saratoga St., Baltimore, Md.; M. N. Ford, 608 High-Long Bldg., Columbus, Ohio.

COMMITTEE ON DRUG STORE OWNERSHIP LAW.

Dr. Jacob Diner, *Chairman*, 233 W. 77th St., New York, N. Y.; H. M. Lerou, Norwich, Conn.; L. A. Brown, Lexington, Ky.

N. A. B. P. COMMITTEE ON RELATIONS OF BOARDS WITH COLLEGES.

(To act with similar committee from the A. A. C. P.)

Chas. J. Clayton, *Chairman*, 1627 Lawrence St., Denver, Colo.; George Judisch, Ames, Iowa; Lawrence C. Lewis, Tuskegee, Ala.; D. S. Whitehead, Boise, Idaho; Alexander Reid, 16548 Woodward Ave., Detroit, Mich.

N. A. B. P. COMMITTEE ON PREREQUISITE LEGISLATION.

(To act with similar committees from the A. PH. A. and A. A. C. P.)

Wm. R. Acheson, *Chairman*, Cambridge, Mass.; Christian Schertz, 1341 Elysian Field, New Orleans, La.; Edgar P. Carswell, Gorham, Maine; Edwin J. Boberg, Eau Claire, Wis.; H. C. Christensen, 130 N. Wells St., Chicago, Ill.

N. A. B. P. COMMITTEE ON STANDARDS AND REQUIREMENTS FOR CLASSIFICATION OF COLLEGES.

(To act with similar committee from the A. A. C. P.)

A. L. I. Winne, *Chairman*, 712 State Office Bldg., Richmond, Va.; A. H. King, 306 Poyntz, Manhattan, Kans.; Charles E. Wilson, Corinth, Miss.; Walter Rothwell, Hatboro, Pa.; L. E. Highley, Hot Springs, S. Dak.

ADVISORY PUBLICITY COMMITTEE.

W. H. Cousins, *Chairman*, Box 1536, Dallas, Tex.; Frank S. Ward, 215 Medical Arts Bldg., Portland, Ore.; H. W. Reuter, 5801 Gravois Ave., St. Louis, Mo.; Wm. D. Jones, 1 E. Bay St., Jacksonville, Fla.; J. P. Jelinek, 961 W. 7th St., St. Paul, Minn.

COMMITTEE ON NATIONAL CERTIFICATE.

H. C. Christensen, *Chairman*, 130 N. Wells St., Chicago, Ill.; John Schmitter, Gypsum City, Kans.; C. M. Anderson, State Capitol, Oklahoma City, Okla.; S. M. Scott, Jr., Terra Alta, W. Va.; John W. Seiden, Lewiston, Mont.

COMMITTEE ON CONSTITUTION AND BY-LAWS.

W. H. Hankins, *Chairman*, Daytona, Fla.; B. M. Keene, 201 N. Delaware St., Indianapolis, Ind.; Frank Haymaker, Clarksburg, W. Va.

GRIEVANCE COMMITTEE.

Edw. H. Walsdorf, *Chairman*, Canal at Rampart, New Orleans, La.; James W. Wise, Dover, Del.; E. V. Zoeller, Tarboro, N. C.; Claude McVickers, Gothenburg, Nebr.; Guy Norton, c/o French Drug Co., Tacoma, Wash.

LEGISLATIVE NEWS.

Colorado.—Charles J. Clayton, Secretary of the Colorado Board of Pharmacy, reports that a new pharmacy law has been introduced in the Colorado Legislature with prerequisite requirements in harmony with proposed legislation in several other States.

Mr. Clayton expresses himself as being confident that this law will be enacted, but goes on to say that the legislative program of Colorado is not going along without considerable opposition, and that he cannot be certain just how it will turn out because the general storekeepers desire all restrictions taken off the sale of "domestic remedies" and pharmacists are not inclined to grant such a concession.

District of Columbia.—A bill to amend the pharmacy law of the District of Columbia, providing among other things for graduation from at least a three-year course in pharmacy for entrance to examination for registered pharmacist, passed the Senate on February 7th and the House Committee on the District of Columbia adopted this Senate Bill and reported it favorably to the House with the recommendation that it be passed without delay. No opposition has developed in the House, and it is hoped that action may be had on the bill in this side of Congress before adjournment. However, inasmuch as there are about 300 approved bills on the calendar and at the writing of this article only a few days to go, it is feared that this important bill may be overlooked in the closing rush. (The bill has been passed and signed by the President, thus adding the District of Columbia to the prerequisite list.)

Kansas.—Report comes from Kansas that the Consolidation Bill for that State which has been pending in the legislature and which, if enacted, would have placed all boards and commissions under a general Secretary, will probably not receive further consideration at this term of the legislature.

The budget director of the State, who was also the sponsor of the proposed Consolidation Bill and the avowed candidate for the general Secretaryship under the bill, was refused confirmation of his reappointment as budget director by the Senate. As he seemed to be the leading spirit in the promotion of this bill before the legislature and as no successor has appeared to push the bill, with the chairman of the Senate committee against it, the bill seems to have passed out for this session at least, with the retirement of its sponsor, the budget director. Pharmacists of Kansas are to be congratulated for the part they have taken in the strong fight against this obnoxious bill.

If this bill had become law, it would have taken from the Board of Pharmacy all its records and shorn it of virtually all its powers except as an examining committee. Here, as in every State where consolidation has been proposed or enacted, the promise of a ridiculously low budget for operating expenses was presented. Consolidation wherever enforced is costing the State more, and sometimes double the amount expended under the former separate board plan. The estimated low cost given at the time a bill is proposed is usually the bait used to secure its passage. Once consolidation is under way, *liberal increases are asked for*, and with the increased cost to the State, not only is there *no* saving in consolidation, but because of the loss of interest by the profession under this plan, consolidation *becomes a menace not only to the professions, but to the public welfare as well.*

Massachusetts.—A bill designated as "House Bill No. 798" has been introduced in the Massachusetts Legislature to limit the so-called "near drug store" or general stores or merchants

to the sale of patent or proprietary medicines, provided they do not contain salicylic acid, barbituric acid, acetanilid, bromine, iodine, strychnine, their compounds, salts or derivatives, or aconite, belladonna, digitalis or nux vomica, and also to permit the sale of certain specified drugs and household remedies by such retail establishments.

North Carolina.—The legislature has enacted a drug-store registration measure, which provides that every drug store or pharmacy in the State shall register with the Board of Pharmacy annually, and that it shall be unlawful for any drug store or pharmacy to do business unless so registered. The fee for such registration is $1.00 annually.

The terms "drug store" and "pharmacy" are defined to mean "any store or other place in which drugs, medicines, chemicals, poisons, or prescriptions are compounded, dispensed or sold at retail, or which uses the title 'drug store,' 'pharmacy' or 'apothecary' or any combination of such titles, or any title or description of like import." Domestic remedies, patent and proprietary preparations which do not contain poisons are exempted.

North Carolina druggists are also busy fighting to prevent unfair and excessive taxation through the State Revenue Act which is pending in the legislature.

North Dakota.—Several amendments to the North Dakota Pharmacy law are being asked in a bill introduced in the legislature of that State, which has passed the Senate and is now in the House; the principal provisions are the following:

1. Defining "drug store" or "pharmacy."
2. Change in the prerequisite requirement of the law so that three- and four-year graduates in pharmacy will only be required to furnish one year of drug-store experience to qualify for examination.
3. Examination and registration fee increased from $5.00 to $15.00; annual renewal fee increased from $3.00 to $5.00; increase in per diem fee for board members from $5.00 to $10.00.
4. Definition of "drugs" and exceptions as to sale.

South Dakota.—A bill was recently enacted by the South Dakota Legislature and signed by the Governor on February 19th, amending the pharmacy law of that State so as to bring it more into harmony with the recent trend of pharmacy legislation, by making a candidate eligible for entrance to examination as pharmacist upon graduation from a three-year course and proof of one year of drug-store experience, or on presentation of proofs of four years of pharmaceutical experience.

It is regretted that this new law does not limit entrance to examination for registration as pharmacist to graduates in pharmacy, and it is hoped that by the time another session of the legislature of that State convenes, those who opposed a straight prerequisite college graduation requirement with at least one year of drug-store experience will see the folly of their attitude in this matter. If, for no other reason, this law, as enacted, is inconsistent, because it is impossible to give a State Board Examination that will be fair to both graduates and non-graduates. The only consolation is that it is a short step in the right direction.

Texas.—Wilford Harrison, President of the National Association of the Boards of Pharmacy and also of the Texas Board of Pharmacy, reports that the proposed new pharmacy law for that State, which he has sponsored, is making satisfactory progress in the legislature. Mr. Harrison states that it has already passed the house by a vote of 75 to 32.

This proposed new law for Texas, if enacted, will put that State in the prerequisite column by requiring college of pharmacy graduation from a three- or four-year course and one year of drug-store experience for entrance to examination for registered pharmacist.

Washington.—Several bills are pending in the legislature now in session at Olympia:

A bill provides that, in drug stores where lunches are served, a solid partition extending from floor to ceiling must entirely enclose the kitchen and dining space, with proper ventilation, and prohibits any person who handles drugs, medicines, or poisons from being employed in the preparation or serving of foods therein; and gives the health officer full power to direct such alterations as he may deem necessary in accordance with the law.

A bill prohibits certain amusements from the vicinity of school houses, and provides for closing confectioneries, lunch rooms, soda fountains, etc., and these departments in drug stores, if within 500 feet of any school, between the hours of 8:00 A.M. and 5:00 P.M.

A proposed amendment to the pharmacy law gives a clearer definition of what constitutes a drug store or pharmacy and will be an aid to enforcement.

Another amendment, which has passed the Senate, corrects the error which crept into the prerequisite law when the college graduation requirement of the present law took away the privilege of reciprocity from non-graduate pharmacists registered prior to the enactment of the law. This amendment seeks to restore the privilege of reciprocity to non-graduate pharmacists registered prior to the enactment of the college requirement.

PERSONAL ITEMS.

John Culley of Ogden, Utah, reports that the Utah Legislature is still in session but that no legislation affecting pharmacy has so far been proposed or enacted.

John then states that he has received an invitation from Dr. Ming of the Pharmacy Department of the Medical School of Pekin to address "if possible" or otherwise write a paper for the Pekin (China) Pharmaceutical Society. He indicates that while he may not at this time be able to appear in person, he will at least send something "possibly on the N. A. B. P." John's popularity is becoming international, and leave it to him, he never loses an opportunity to act as publicity agent for the N. A. B. P.

E. H. Riske, Secretary of the Missouri Board of Pharmacy, has purchased, with Alfred Tilgner of Kansas City, the Watkins Drug Store in Independence, Mo. Mr. Riske is also interested in a store at Ash and Van Horn Sts. in Independence. N. A. B. P. members wish him success in his new venture.

W. L. Lyle of Bedford, Va., a member of the Virginia Board of Pharmacy, received painful injuries about the head in an auto accident recently but was fortunate in escaping more serious injury when two machines, in one of which he was a passenger, met head on in the underground tunnel of the N. Y. W. Railway at Bedford.

Under the title, "We Congratulate **J. S. Rutledge,**" an interesting article in the form of a biographical sketch of the Vice-President of the Ohio Board appeared recently in a leading *daily* of Akron, Ohio, his home city. The occasion of the publication of the article was Mr. Rutledge's thirty-seventh birthday.

Mention was made of how young Rutledge in his boyhood days in "playing store" had always made it a drug store where pills, powders and potions were purveyed. The write-up then goes on to say that after graduation from high school, he was reminded of his juvenile hobby for conducting a drug store and decided on pharmacy as a career.

He was graduated from the University of Pittsburgh College of Pharmacy with honors in 1908 and, thereafter, actively engaged in the retail drug business; first, as a clerk and, two years later, as a partner in a prosperous business. He is now Secretary-Treasurer of the Rutledge Drug Co. The corporation operates eight stores in Akron.

Mr. Rutledge was appointed a member of the Ohio Board of Pharmacy in 1925, and aside from his activities as a pharmacist and a Board member he finds time for numerous other activities, including social, fraternal and sporting. Commenting on his many and varied interests, the article closes with the statement that "he also enjoys big game hunting in the Canadian wilds, and is bravely practicing at golf;" that for his "mental relaxation" he chooses the family fireside in the company of Mrs. Rutledge and their daughter.

GENERAL NEWS ITEMS.

President **D. B. R. Johnson,** of the American Association of Colleges of Pharmacy, recently announced the membership of the A. A. C. P. Committee on Relations of Colleges and Boards to work with a similar committee from the N. A. B. P. as follows: Dr. Charles H. LaWall, *Chairman;* Deans E. R. Serles, Gordon A. Bergy, Claire A. Dye and Wilbur J. Teeters.

The A. A. C. P. has divided the country into nine districts, with a chairman for each district, to correspond with similar districts of the N. A. B. P. This gives opportunity for the district chairmen to coöperate and to arrange for conferences between the board members and college faculties in the respective States of the district at least once a year. President Harrison of the N. A. B. P. and President Johnson of the A. A. C. P. have availed themselves of this arrangement and plans are being made in several districts for joint meetings of board members and

college faculties of each entire district. These meetings undoubtedly will result in a better understanding and solution of our common problems.

James L. Avis, Harrisonburg, Va., died February 3, 1927. Mr. Avis was in his eighty-third year and had long been identified with pharmaceutical activities in the Old Dominion. He was prominent in association affairs during his active years and served as a member of the Board of Pharmacy for several terms, and as President of the Board for a number of years.

An interesting incident in the early life of Mr. Avis was connected with John Brown. Mr. Avis was a son of Captain John Avis, Sheriff of Jefferson County, and was appointed by his father as one of the guards of the abolitionist prisoner and, later, witnessed the execution of the famous captive.

Mr. Avis opened a drug store in Harrisonburg, in 1869, and operated it for fifty-eight years. It is still being run by a son, Payne M. Avis. (*Virginia Pharmacist.*)

STATE BOARD OF PHARMACY NEWS ITEMS.

Alaska.—Ralph Kitzmiller, of Anchorage, succeeds William H. Caswell, of Cordova, as a member of the Board for the Third Division. Mr. Caswell has retired from the retail drug business and accepted an appointment as Deputy U. S. Marshal at Sitka, Alaska.

Calvin G. Brinker, of Nome, has retired from the Board, and the two existing vacancies in that district have been filled by F. D. Sheldon and George L. Olson, both of Nome.

Arizona.—The case testing the constitutionality of that part of the Arizona Pharmacy and Poison Law which reads—"it shall be unlawful for any dealer to sell any drugs or household remedies without complying with the requirements of this section (15)"—is now ready to be presented to the Supreme Court. The brief covers 17 pages and the attorneys feel hopeful of a favorable decision. If this favorable report is confirmed by the court, Arizona will have a good clean law and one that can be enforced, placing responsibility on all who sell drugs in the interest of the public health.

The Board meets April 13th and 14th at Phoenix in the State House.

Colorado.—The Winter examination, which was held in Science Hall of the University of Denver, was notable for two things: firstly, the large number of candidates, 42 for the "registered pharmacist" grade and 5 for the "assistant;" and secondly, by the small number who were successful in passing the examination—only three of the forty-two being granted full registered certificates, while three of the five who took the "assistant" test passed. A year ago, there was a total of 51 who appeared for the test, but with that one exception, this was the largest class which ever appeared at a January meeting.

Of the three who passed the registered pharmacist examination, one was a graduate in pharmacy, one had had a year of pharmaceutical schooling, and one a "short course." Two of the three assistants passing were "short course" students and the third reported no pharmaceutical schooling whatever.

Of those who failed to pass the full registered examination, one reported four years of pharmaceutical schooling; one, three years; one, two and a half years; four, two years; one, one and a half years; one, one year; two, a half year; five, one year supplemented by a "short course;" fifteen, a "short course" only; and nine reported no pharmaceutical schooling at all.

Of the successful ones in both examinations, one was taking the Board for the second time, another the fourth time. For the other four, this was the premiere.

Reciprocal registration was granted recently to Silas E. Austin, of Iowa; Harry McMullin, Jr., of West Virginia; Anthony F. Weingart, of Missouri; Charles H. Cole, of Minnesota; Cecil B. Gilbert, of Nebraska; Ray H. McAtee, of Missouri; Ernest D. Eson, of Kansas; E. H. Lollar, of Illinois; W. V. Blackwell, of Washington.

The next Denver examination will be held in Science Hall of the University of Denver, May 13th and 14th.

Illinois.—At the January examination, 110 applicants presented themselves for the "registered pharmacist" examination, and 33 out of this number attained the passing grade; out of 30 applicants for the "assistant pharmacist" examination, 11 made the passing grade.

A joint meeting of the school faculties and Board members has been announced for March 21st, to which meeting Secretary Christensen of the N. A. B. P. has been invited. The purpose

of the meeting is to determine the cause of the failure of so many graduates taking the examination and to seek to remedy this condition.

Iowa.—A copy of the biennial report of the Iowa Pharmacy Examiners for the period ending June 30, 1926 has been received. A complete list of the 4177 licensed pharmacists in good standing is given, with addresses. Receipts of the Board for the two-year period amounted to $84,707.00. These include venders' license fees, $65,000.00; annual renewals, $16,477.00; delinquent renewals, $251.00; examination fees, $1875.00; reciprocal registration fees, $490.00; certificates of grades, $348.00; license transfers, $235.00; duplicate certificates, $23.00; changes in location, $8.00. Out of the amount collected by the Board, the State Pharmaceutical Association was paid $8348.00. The Iowa law provides that one dollar of the two-dollar renewal fee shall be paid to the State Association, to be used by that organization in the advancement of the art and science of pharmacy.

Kentucky.—The Board, recognizing that there is a practical need for the "assistant pharmacist" and that the "assistant," as intended under the Kentucky State Law, shall be fit and competent to be left alone in a drug store or pharmacy during the temporary absence of the "registered pharmacist," adopted a resolution at its January meeting requiring applicants for "assistant" registration to pass an examination in practical work—actual compounding of prescriptions, etc.—in addition to the written examination previously required.

The next examination of the Board will be held at Paducah (Palmer House), beginning Tuesday, April 12th, at 9:00 o'clock.

Massachusetts.—Leon C. Ellis of Lynn has been appointed a member of the Board to succeed Frederick W. Archer of Boston, who retired on December 1st.

The following officers were elected for the coming year at the annual meeting: William R. Acheson, of Cambridge, *President;* Chas. W. King, of Chicopee Falls, *Secretary.*

At a recent examination, fifty-five candidates were examined for the "registered pharmacist" certificate, fifteen being college graduates and forty non-graduates. A total of twenty-four was successful—ten of them were graduates and fourteen non-graduates.

Reciprocal registration has been granted to Lionel James Matheson of Vermont.

Mississippi.—In compliance with resolutions adopted by the N. A. B. P. regarding a meeting of Board members and faculties of schools of pharmacy in each State, plans are now being made by Dean H. M. Faser of the School of Pharmacy of the University of Mississippi, and Charles E. Wilson, Secretary of the Mississippi Board of Pharmacy, wherein provision is made for a meeting in the near future.

Missouri.—At a recent meeting, 38 candidates were examined for registration as registered pharmacists. Thirteen of this number were college graduates and twenty-five non-graduates. A total of twenty-five was successful, 10 were graduates and 15 non-graduates. Thirty-five out of forty taking the "assistant" examination were successful.

Reciprocal registration was granted to F. J. Schaul, of Iowa; H. C. Smith, of Kansas; Cash Davis, of Oregon; F. W. Murphy, of Oregon; J. L. Rousset, of Louisiana; J. O. Yaryan, of Utah; G. M. Herriot of Indiana; and P. A. Jones of Nevada.

Examination meeting will be held April 11th and 12th at Kansas City, and June 13th and 14th at St. Louis.

New Mexico.—Reciprocal registration has recently been granted to William Van Lue of Albuquerque (from Indiana) and Victor J. Goetz (from Pennsylvania).

The next regular meeting of the Board is called for May 23rd and 24th at Albuquerque.

Ohio.—The State Board of Pharmacy conducted examinations on January 10th and 11th with 63 candidates applying for the registered pharmacist certificate. Thirty-seven were successful. Twenty-three candidates took the "assistant" examination and 18 were granted this grade of certificate.

The next examination will be held in Columbus, on April 5th.

Virginia.—A special session of the Virginia Legislature is called for March 16th. The purpose is to reorganize the State Government by consolidation into about a dozen departments. A preliminary report does not indicate that the Board of Pharmacy will be affected.

An annual business meeting of the Board of Pharmacy will be held at Richmond on Tuesday, April 26th. No examinations will be given at this meeting.

S. C. Brooks of Winchester was appointed, March 1, 1927, as a member of the Board for

a term of five years to succeed J. W. Williamson of Harrisonburg, whose term of office expired.

The Virginia Pharmaceutical Association will meet at Virginia Beach on June 21st, 22nd and 23rd. Headquarters will be the Pinewood Hotel.

BILL TO REORGANIZE PROHIBITION SERVICE IS PASSED BUT MEDICINAL SPIRITS BILL FAILED TO PASS IN SENATE.

THE bill providing for the reorganization of the Prohibition Bureau and its field force was passed by both Houses and signed by the President. The medicinal spirits bill was passed by the House but died in the Senate.

Under the terms of the reorganization bill the Secretary of the Treasury is made the chief responsible prohibition enforcement officer. He has the appointment of the Prohibition Commissioner and of an Assistant Commissioner, two Deputy Commissioners, one Chief Clerk and such attorneys and other officers and employees as he may deem necessary. This arrangement places the determination of all important questions regarding prohibition enforcement under the supervision of a Federal Government official having the rank of a cabinet officer.

Any action or decision of the Secretary of the Treasury shall be subject to the same review by a court of equity as the action or decision of the Commissioner of Internal Revenue prior to the effective date of this act—April 1st.

The failure of Congress to pass any of the several medicinal spirits bills framed by the Ways and Means Committee leaves the Willis-Campbell Act in full force and effect with respect to the resumption of distillation for the purpose of providing a stock of medicinal liquor properly aged to meet the exhaustion of the supply now on hand. The failure of enactment of the medicinal spirits bills continues the right of wholesale druggists to distribute medicinal liquor as heretofore.—E. G. E.

THE LISTER CENTENARY.

Joseph Lister was born April 5, 1827, in Upton Lane, West Ham (London). The centenary of his birth will be celebrated in England during the second week of April and memorial meetings will probably be held in all civilized countries. The difficulties that obtain in effecting a change, however unsatisfactory established practices may be, were clearly evident in the eventful life of Doctor Lister. Fifty years ago, Mr. Duplay, editor of the *Archives Générales de Médecine*, although admitting the success of Lister's surgery, sought to find for it an explanation other than the obvious one. This was years after Lister had practiced antiseptic surgery. The attacks on Lister, in his own country, continued later than this; in fact, it was not until 1879 that London acknowledged Lister's great work. Twenty-five years ago—at a banquet to Lord Lister given by the Royal Society—Mr. Bayard, the American Ambassador, in addressing the honored guest said: "My lord, it is not a profession, it is not a nation, it is humanity itself which with uncovered head salutes you."

Lister attended the International Medical Congress in Philadelphia in 1876. Mention in this JOURNAL is proper because of the interdependence in the labors of the medical divisions; the work of Scheele, Labarraque, Calvert, and more particularly, that of Pasteur were needful for the beneficent achievements of Lister. The great surgeon died February 10, 1912 and, strange as it may seem, his death was not known in London until about thirty hours after his passing, so unostentatiously lived this modest man after retiring from active practice.

The Centenary of the birth of Lord Lister falls on April 5th and will be celebrated in London on April 6th and 7th. Memorial services will be held in Westminster Abbey. Various organizations which have been benefited by the work of Lister will celebrate the anniversary.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

THE TEACHING OF PHYSIOLOGY AND PHARMACOLOGY IN SCHOOLS OF PHARMACY.*

BY W. H. ZEIGLER.

The purpose of this short paper is to discuss when, where and how the two allied sciences—physiology and pharmacology—should be taught in the school of pharmacy.

It is a very simple thing to define physiology, but it is very evident, from a review of the definitions given in our standard textbooks, that the term pharmacology may be defined to suit the convenience of the teacher.

I have the honor of teaching both pharmacy and medical students. We who teach in institutions that have both schools are told that it would not be good pedagogy to teach medical and pharmacy students at the same time. The medical student is taught pharmacy, toxicology and pharmacodynamics by lecture, demonstration and laboratory work, while the pharmacy student is taught materia medica, toxicology and pharmacodynamics, principally by lectures and recitations.

It is just here that I would like to call your attention to what I believe is a weak point in our pharmacy curriculum—I refer to the teaching of physiology and pharmacology.

First of all, I do not believe the short course in physiology, taught as it is by lectures alone, is worth a great deal to the student. It has proved to be one of the most difficult studies in our school and we have had more "conditions" in this branch than any other. I do not concur in the belief of some that it is due to the poor preparation of our pharmacy students, but that it is due, principally, to the fact that they do not get laboratory work at all. Think of teaching pharmacy, chemistry or pharmacognosy by lectures alone! We should require one laboratory period for every lecture period. I am not prepared at this time to say just how many hours are necessary, but I am convinced that laboratory work in physiology should be required. I have never taught physiology, but this is my candid opinion. In order to get the viewpoint of the physiologist, I have asked our Professor to express his views and, with your permission, I will read them to you.

"Physiology belongs in Pharmacy because of its intrinsic value to any individual to understand the major workings of his body, because of its prerequisite value to other branches, and in order that the pharmacist may be at home in the atmosphere in which his profession naturally places him.

"There is a commercial value to the study of physiology, because it makes a better salesman of the pharmacist in dispensing the mechanical adjuncts of medicine, when he understands their physiological action and dangers. It also makes him a better purchaser to know the more valuable and useful products.

"None of these reasons require that he should be a finished Physiologist and the time for such a course would be unfairly taken from the more basic branches.

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* Presented before the Section on Materia Medica of the American Association of Colleges of Pharmacy, September 13, 1926.

"The length and character of the course should be about and a little better than a course of the grade of sophomore work for a Bachelor's degree. The time set by the council as sixty-four hours could not be shortened, and—by intensive use by the student, and logical use by the teacher—could be made satisfactory.

"The purpose of all laboratory work is discovery, illustration and facility. The laboratory is an addition to, and not a substitute for, study. The economical use of curriculum hours compels us to remember that the laboratory period is twice and in some cases three times the lecture period.

"Much of our knowledge is gained by comparison and anatomical structure and physiological action being basic must be seen to be comprehended. Hence, the necessity for laboratory work in the teaching of physiology.

"Not only time but material offers difficulties in the introduction of laboratory work in this course. Both of these can be successfully met. They must be, because the illustration and facility which come from the laboratory or similar work are needed in the teaching of physiology.

"In addition to the laboratory charts, models and dissections must be used.

"As to time, as much preparatory work as possible must be done prior to the teaching period. Laboratory set-ups must be ready when the class starts. Previous instructions given to prevent 'lost motion' in starting. There must be no such thing as dead time. The time of the men and of the work must be checked, and with that breadth of comprehension which would keep the exercise from being mechanical. Doubtful experiments must be eliminated. Repetition, when used, must be presented in a different form and to bring out additional facts. The experiments must be such as unfold knowledge to the student and for the acquisition of knowledge by him from observation. Observation, as a form of acquiring knowledge, must be cultivated.

"Mechanical principles must be shown by mechanical models which are followed by anatomical specimens showing physiological action so as to translate mechanical action into living motion."

(Human specimens must be previously prepared after cogitation as to the particular fact that is to be observed. It is facts, observations and conclusions we desire, not visual attention alone.)

"Since physiology in distinction from anatomy is in principles not form, and since anatomy is plan rather than detail, animal specimens are invaluable. Fresh organs may be secured and given to the students to handle; the plan of handling is previously arranged. These may be demonstrated and comprehensive excercises, economical in detail, are required of the student.

"The trachea, the lung, the basics, tissues, the eye, the coats of digestive tract, the oesophagus, the kidney, the heart, arteries, pancreas, spleen, liver, spinal cord, etc., of the animals lend themselves wonderfully to this work. Previous and definite arrangements should be made for obtaining these from the butcher or direct from the abattoir. Fresh specimens or those kept on ice are far superior to those kept in solution. In fact these latter are of doubtful value. The domestic animals and usual laboratory animals offer useful facilities. (With these, demonstrations in vivo can be given.)

"Demonstrations should not be by the teacher alone, but the majority should be by handling by the student; special exercises should be arranged for each organ.

"The student should be so guarded and warned that he does not get the idea that time *per se* spent in the laboratory is knowledge gained, or that the laboratory is a substitute for work or knowledge, but that it calls for special work. It is not to take the place of his regular study, but to make the knowledge gained thereby more comprehensible, more feasible and more permanent."

Pharmacology is quite as important as any of the other branches in our curriculum, and yet very few of our schools teach it as such. Some of the schools offer a short course in bio-assay. I believe that certain divisions of pharmacology should be stressed. There is, undoubtedly, too much over-lapping in the teaching of pharmacognosy and pharmacology. There is no need for the pharmacologist to repeat the botanical origin, family, etc., of the drugs. The pharmacologist should stress the preparations, doses, physical and chemical characteristics of

the drug. The physiologic, toxicologic and therapeutic action is equally important. However, of the sub-divisions of this important study, toxicology and bio-assay are the most important to the pharmacist.

Toxicology should be taught by lectures, demonstrations and laboratory work. Nothing you can say will impress and aid the student in remembering the treatment of a poison as will an experiment upon an animal.

A toxic dose of bichloride of mercury is administered to an animal by stomach tube or by placing a tablet on the back of the tongue and washing it down with water. Upon another animal follow the same procedure but administer the treatment. The student will never forget what he has seen demonstrated and will be ready when an emergency arises to render first aid and not lose valuable time looking up antidotes and trying to get a physician.

I know of a case that happened, just recently, in which the pharmacist sold carbolic acid to a customer, who drank it in the store. He called the ambulance. It was one hour before the patient received treatment and, of course, died.

Another case, where the pharmacist gave sweet oil to a young man who drank the carbolic acid he had just purchased. He died too. Two lives that perhaps could have been saved, if the proper treatment had been given. I am satisfied that toxicology should be stressed.

Bio-assay is another sub-division that should have more hours allotted to it. This study should also consist largely of laboratory work. You cannot teach bio-assay without frogs, guinea-pigs, cocks and dogs. The students should work in groups and every bio-assay method should be worked out in the laboratory.

Pharmacodynamics or the study of the physiologic action of drugs should also be taught by lecture, demonstration and laboratory work. As with physiology, I do not believe it necessary to allot as many hours as we do to the medical student, but certainly you cannot teach this subject by lectures alone.

Therapeutics or therapy-dynamics is a division of pharmacology the pharmacy student should be familiar with. It is not necessary, however, to stress this subject. I do not agree with those who are of the opinion that a knowledge of the uses of drugs in the treatment of disease will encourage the students in the idea that they are being prepared to counter-prescribe.

The pharmacologist should confine his teaching to useful drugs rather than used drugs. Teach the student the source, dose, official and common names of the drug and its preparations, then the physiologic action, therapeutics and toxicology. This should be followed by actual demonstrations in the lecture room and by exercises in the laboratory.

To summarize:

1. Physiology and pharmacology should be taught by lectures, demonstrations and laboratory work.
2. Bio-assay should be stressed and consist principally of practical work.
3. The course in physiology should be given during the first year.
4. Pharmacology is a subject for the second year.
5. Bio-assay should be taught in the third and last year.

CORRESPONDENCE

SAL ÆRATUS.

BY OTTO RAUBENHEIMER.

With much interest did I read the comments on this subject in the JOURNAL A. PH. A. for December and January. May I be permitted, as one especially interested in the History of Pharmacy, to add my "grain of salt?"

There is no question that the original Salæratus, anglicized in Saleratus, was an impure potassium sesquicarbonate, a mixture of potassium carbonate and bicarbonate. This was prepared by allowing "Pearlash," a pearly or granular form of K_2CO_3 to absorb additional CO_2. This process of manufacture was usually carried on in the fermenting room of breweries, the old-fashioned breweries where beer was made by fermentation—the kind of beer which makes our, at least my, mouth water when we think of those bygone days. Just as the old-fashioned beer, so the old-fashioned "Potash Saleratus" is at present unobtainable. Consequently to-day it is the common practice in pharmacies, drug stores, grocery stores, etc., to dispense Sodium Bicarbonate when Saleratus is called for.

Then there is another reason, an economic reason. Potassium bicarbonate is generally kept in pharmacies in the crystalline form, although it can also be obtained as a powder, and costs at wholesale about 30 cents a pound, while sodium bicarbonate only costs about four cents a pound by the keg. I pity the drug clerk who sells one pound of "Potash Saleratus," $KHCO_3$ and charges the customer sixty cents a pound and I pity him still more if he dispenses the crystals instead of the powder. These are things which you will never learn in College, but only by practical experience in a real pharmacy. It is practice that makes perfect.

I cannot subscribe to the statement by Prof. Brown on page 60 of the January JOURNAL: "Sal æratus means literally an 'Ærating Salt.'" This is not quite right, my dear Professor. Ærating Salt—the present participle in Latin would be "Sal Ærans"—the salt for ærating. On the other hand Sal Æratus—the perfect passive participle—means "*Aerated* Salt"—the salt which has been ærated, namely, K_2CO_3 ærated with CO_2. The name refers to the process by which the salt is manufactured, not to the purpose for which it is used!

Last of all this little discussion again proves the value of knowledge, even superficial knowledge, of History of Pharmacy. It was for the object of promoting, in fact, popularizing this knowledge that the writer helped to organize the Society for History of Pharmacy, during his recent European trip, as fully outlined in the notice in the different pharmaceutical journals, including the JOURNAL A. PH. A., December 1926, p. 1150.

History is clarified experience (Lowell).

ANOTHER LIFE MEMBER.

Indianapolis, February 22, 1927.

MR. E. F. KELLY, *Secretary:*

Yours of February 15th, followed by certificate of Life-long Membership in the A. PH. A. to hand. I am very proud to be known as a Life Member of an organization which I have always been proud of and to which, in my time of business activity, I was able in a small way to contribute to its success.

Many happy memories are brought to my mind and to Mrs. Carter's in looking back over past associations in the A. PH. A.

I have retired from active business but am in reasonably good health.

With kindest regards,

(*Signed*) FRANK H. CARTER.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

BALTIMORE.

The February meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Emerson Hotel on Friday evening, February 25th, Dr. L. M. Kantner presiding.

The following resolutions were adopted on the recent loss of a former President and active member of the Baltimore Branch—Dr. Hermann D. Engelhardt:

"WHEREAS, death has removed from our midst our beloved and respected friend and former President, Dr. Hermann D. Engelhardt, therefore

"*Be it resolved:* That the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION through the death of Dr. Engelhardt has lost a distinguished scientist and scholar, a loyal and faithful servant, a true friend and comrade, the memory of whose many lovable acts and deeds shall ever abide with us.

"*Be it further resolved:* That a copy of these resolutions be sent to the family of Dr. Engelhardt, the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, and entered upon the minutes of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION."

Students of the School of Pharmacy of the University of Maryland debated on the subject:

Resolved: That drug-store experience should be abolished as a requirement for registration as a pharmacist.

Affirmative: Benjamin Bretzfelder, H. B. Rudo, M. B. Hack.

Negative: Joseph C. Bernstein, M. B. Rosenberg, Paul Carliner.

Messrs. E. G. Eberle, H. A. B. Dunning, Channing W. Harrison and John C. Muth acted as judges, and Messrs. Charles E. McCormick and L. L. Miller were the timekeepers.

The judges were unanimous in deciding in favor of the arguments as presented by the debaters upholding the negative side of the question.

The question under consideration brought forth many reminiscences and considerable discussion from Messrs. Louis Schulze, H. A. B. Dunning and R. L. Swain.

The four Itzoe Brothers presented the musical program of the evening, which included several semi-classical renditions, as well as novelties.

The meeting was an especially interesting one and the large attendance of members and friends was very encouraging to the recently elected officers of the Branch.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 164th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the School of Pharmacy Building, February 11, 1927, with an attendance of more than 100. The annual meeting of the Branch, which had been postponed from the January meeting, was called to order with President Peter J. Kolb in the chair. A report of Secretary-Treasurer Gathercoal was presented as follows:

During the year 1926 the Branch has held eight meetings, namely, the 155–162 inclusive. The average attendance at the meetings approximated 60. All of the meetings except one were held at the University of Illinois, School of Pharmacy Building. The meeting at which John Thomas Lloyd presented an illustrated lecture on "Coca" was held at the

LaSalle Hotel following a dinner in honor of John T. Lloyd and John Uri Lloyd. Other speakers of prominence before the Branch during the year were Dr. W. W. Charters, F. A. Upsher Smith on "Digitalis," Sherman W. Morrisson, Peter J. Kolb and Prof. C. M. Snow. The reception to new members at the December meeting combined with entertainment and refreshments by the Sorority brought out a large attendance.

During the year 77 of our members resigned or were suspended, two are deceased (T. S. Wakefield and R. E. Doolittle), and 17 moved away from Chicago. This total of 96 loss is offset by 95 gained into the membership, hence, the net membership December 31, 1926 was 474.

FINANCIAL STATEMENT.

Balance on Hand, Jan. 1, 1926	$152.97
Contributions from members	194.00
Commissions (new members)	20.00
Lloyd dinner	57.50
	$424.47
Printing and postage	$151.56
Speakers	27.50
Lloyd dinner	100.40
Sundries	14.70
Balance December 31, 1926	130.31
	$424.47

The report of the Committee on Nominations was received, approved and the following officers elected: *President*, E. N. Gathercoal; *First Vice-President*, H. C. Christensen; *Second Vice-President*, J. Harry Lindahl; *Third Vice-President*, F. O. Snyder; *Council Member*, Peter J. Kolb; *Secretary-Treasurer*, Sherman W. Morrisson. COMMITTEES: *Membership*, Wm. Gray; *Legislation*, J. Riemenschneider; *Practice*, I. A. Becker; *Medical Relations*, Dr. Bernard Fantus; *Publicity*, Samuel C. Henry.

Prof. E. L. Newcomb, *Secretary* of the National Wholesale Druggists' Association presented the address of the evening on the subject of "Distribution in the Drug Trade." Dr. Newcomb first explained the Druggists' Research Bureau, the organization of which was very recently completed. He outlined the history of this movement and described the meeting of the nine delegates held January 17th. This board of delegates consists of two appointed by the N. A. R. D., two by the American Association Colleges of Pharmacy, two by the National Wholesale Druggists' Association and three by the Manufacturers' Association. The board of delegates recognized that the retail pharmacists needed help along the lines of business and financial research. It is estimated that at least 456 research agencies are working along these lines, yet very few of them are directly helpful to the retailer in the drug business. The delegates also recognized the need of a very extensive and representative membership in the Bureau, and provision is made for five classes of members representing clerks and assistants, retail pharmacists, teachers, wholesale and jobbing interests and manufacturers. The National Wholesale Druggists' Association had a sum of about $17,000 available for education and research and turned this amount over to the Research Bureau. As this sum will practically meet the expenses of the Bureau for the first year it was decided that there should be no membership dues the first year and that an endeavor should be made to reach every member of each class, setting forth the aims of the Bureau and soliciting membership in the Bureau. It is expected that the membership will reach at least 25,000 this first year.

The essence of Dr. Newcomb's address centered about 12 planks in a great business platform. He was not prepared to put these planks before the meeting and pharmacy in general in a positive form but preferred to indicate them by questions, thus leaving each plank open for discussion. It is his expectation that out of this discussion will emerge a unanimity that can be concretely set forth in the form of statements acceptable to every division of pharmacy. His platform as thus presented is as follows:

1. Should every business transaction yield a profit?
2. When the dealer sells an item at less than cost, how is he going to make up the loss on that item?
3. What should be the remuneration to the distributor for his services?
4. What should determine the discounts upon purchases larger than the usual quantities?
5. What are we to consider as excessive or unreasonable quantity discounts?
6. Are special offers undesirable to good business? Are they fair to the public?
7. Do "free goods" offers promote good business?

8. Are demonstration offers fair to all branches of the trade?

9. What shall be done regarding the employment of "hidden" demonstrators?

10. Is it fair to subsidize customers' employees either by direct payments or by indirect means?

11. Is it fair to subsidize dealers either directly or indirectly?

12. Is it possible to unite all branches of the drug business on economically sound planks which are fair to all interests from producer to consumer?

Dr. Newcomb presented many splendid illustrations and emphasized his points in his usual forceful manner. Out of the address we might summarize the following points:

1. The great need of such a platform to establish profitable prices, to overcome destructive competition and to promote business ethics; harmony and assurance is so self-evident that it would seem as though emphasis is not necessary. However, there is no use in holding conferences between different groups until there is a reasonable unanimity in each group.

2. It is an altruistic problem, of course—pure altruism—the greatest good for the greatest number. However, we must get together on a positive platform and stop taking a negative attitude.

3. It demands organization and coöperation. These have been discussed as features of the whole drug business. The discussion must crystallize into action.

4. Such a platform with a fair degree of unanimity from every branch of the business can be had, only fear and lack of faith will prevent the completion of such a program.

5. Do your part as an individual or as a relatively small group of individuals to answer these questions in your own way to the best of your knowledge and belief and send your answers to the Research Bureau. It is only by comparing and coördinating replies from many different sources that we shall be able to compile a platform that represents a fairly unanimous opinion from the whole of pharmacy.

Chairman J. H. Riemenschneider, Executive Committee N. A. R. D.: "Free deals constitute one of the toughest problems the retailer must meet and they come in such a variety of forms that it requires almost a legal knowledge and certainly an acute mind to follow all of their ramifications and to analyze them. The N. A. R. D. as a great organization recognizes the need of meeting the problems as set forth by Dr. Newcomb and stands ready to help."

Secretary Herman Holthoefer, C. R. D. A.: "We heartily endorse the Druggists' Research Bureau and believe that Dr. Newcomb has ably presented the very fundamentals of our business problems."

C. P. Van Schaack: "The retail drug business has changed much from the old days. To a great extent the problems of the retail druggist have changed. This able presentation by Dr. Newcomb should prove a splendid foundation for meeting any of these problems."

Oliver C. Buss: "It is possible for a manufacturer to put an extensive line of goods into the retail drug store without his merchandise being advertised or sold at cut prices. Our firm has demonstrated this. Merchandising is a great art. The manufacturer depends upon the prosperity of the retail druggist. Selfishness as a trait of human nature has always existed and will always exist but it is possible to demonstrate that unselfishness to-day may be very profitable to-morrow. Let us approach this problem as an industry not as an individual."

Samuel L. Antonow: "Getting the retailer to help is the most difficult part of this whole plan. The coöperation of the retailer can be had only through retail organizations. Co-operation between the retailer and the wholesaler, which frequently seems so lacking, is very important and should be encouraged. If steps are not taken to change the present trend of things retailing in the drug business will soon be in the hands of a few. To-day 65 per cent of the retail business in the grocery line is in the hands of the chain stores."

George V. Haering: "We heartily endorse this plan of Newcomb's. Sometimes it seems as though the rank and file of the retail druggists are of the jelly-fish order. Organization is what will put it over."

Paul Gibney: "Newcomb's plan is good but it means lots of work. However, hard work never killed any man. Lets get busy on it."

F. O. Snyder: "Many look upon the chain store as of the dragon type. This is not so. Newcomb's plan is wonderful—a big bite truly but possible. The retail drug business is in a state of evolution from the old-time pharmacist to merchandiser."

Secretary H. C. Christensen, N. A. B. P., "Nothing is ever accomplished by saying—'It can't be done.' Let us who are present

to-night back this plan of Newcomb's. We sometimes look back and think that pharmacy is deteriorating but let us be assured that at no time in its history in America were young pharmacists more highly educated than to-day. This higher intelligence coming into the business will help solve these problems."

E. N. Gathercoal: "In my early days many a retail druggist hated his neighbor druggist to the extent that they were not on speaking terms. In a relatively few years organization among retailers has wrought a great change. A few years more will bring even greater results and the day is not far distant when retailers will be working on these great problems as presented by Newcomb, in hand with each other and with the jobber and manufacturer. In order to accomplish our little bit I would move that the *President* be authorized to appoint a committee to formulate answers to Newcomb's questions, not with the thought that such planks would be perfect but that they might be added to the work done by other individuals or groups, the report of this committee to be forwarded to the Research Bureau. This motion also carrying an endorsement of the Druggists' Research Bureau was unanimously passed.

A motion of thanks to the out-going President was unanimously approved by a rising vote.

E. N. GATHERCOAL, *Secretary.*

DETROIT.

The February meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the new headquarters of the Wayne County Medical Society, February 10th.

Dinner was served at 6:30 P.M. The usual table-chat was livened by the presence of our friends from the University of Michigan, Prof. Stocking, Glover, Blicke and Mr. Powers.

The meeting was called to order by President Rowe. The minutes of the previous meeting were read by the Secretary and approved. President Rowe read, in part, a letter from Dr. Fischelis to Secretary E. F. Kelly, instructing him to get in touch with the authorities in charge of the Chicago Exposition of 1933, in accordance with the resolutions adopted by the Detroit Branch to take part in the International Temple of Health Exhibit.

Chairman Lakey, of the Program Committee, announced that Dr. Noah Aarenstein would be the speaker at the March meeting. The April meeting will be Clerks' night, and the May meeting will be the Annual University of Michigan night at Ann Arbor.

President Rowe introduced the speaker of the evening, F. O. Taylor, Chief Chemist of Parke, Davis & Co., who gave a most interesting talk on "New Medicinals." Mr. Taylor said that with preservation of life—the goal of mankind—there are great opportunities to-day for pharmaceutical chemists. He outlined in detail many new medicinals introduced in the last few years. The more prominent ones being *Ephedra*, discovered by Nogi, a Japanese, many years ago and recently rediscovered by Chen and his staff at Pekin University where the alkaloid Ephedrine was isolated and which is now in use in the form of ephedrine sulphate. Tetrachlor-phthalein and acetylene have been found to produce sleep and are now being used for anesthesia. Mr. Taylor exhibited samples of these products. "Ephedra and vitamines," he said, "stimulated the research for other medicinal plants; metallic products have come to the fore through the success of neo-arsphenamine." Insulin in a crystalline form has been reported by Dr. Abel of Johns Hopkins. Phenol-iodo-tetraphthaleine has been a great help in X-ray work. Ortho iodexin benzoic acid has been the work of Prof. Blicke of University of Michigan. Peroxide of Hydrogen in solid form has been prepared with urea. Borocain, butein, hexyl resorcinol were also mentioned among the new medicinals.

Mr. Taylor said the biologicals were still receiving their share of attention including glandular products, also the immogens, particularly at this time; that researches were being conducted by every prominent university in the hope of finding new medicinals. The University of Michigan is working on fluorines.

A general discussion followed Mr. Taylor's talk in which he answered the questions propounded. He was given a rising vote of thanks.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

More than eighty members and friends of the New York branch of the AMERICAN PHARMACEUTICAL ASSOCIATION were present at the February meeting. Frederick D. Lascoff discussed a paper, "A Procedure in Prescription Pricing," by Leonard A. Seltzer and A. Alton Wheeler. Joseph L. Mayer opened a discussion concerning the present formula for solution of magnesium citrate.

It was the opinion of those present that the plan of Mr. Seltzer and Mr. Wheeler was an eminently practical one. Following the discussion of the formula for citrate of magnesia solution the branch adopted a resolution urging reconsideration of the formula by the U. S. P. Revision Committee.

PHILADELPHIA.

The February meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, February 8th, at the P. A. R. D. Building, 2017 Spring Garden St., President Cliffe presiding.

Upon a motion from the floor the reading of the January minutes was dispensed with.

Two applications were presented for membership in the parent body, and they were accepted pending the action of the parent association. They were for Harry Wm. Mantz and Ray C. Gable both of Philadelphia.

Mr. Peacock, Treasurer of the A. PH. A. Convention Committee, made a final report for the Committee and presented the Branch with a check for $14.67 which represented the balance left over from the convention funds. The archives of this Committee were also turned over. The report was accepted and the archives referred to the Auditing Committee of the Branch. It was moved that the $400.00 which had recently been received from Mr. Peacock's Committee be deposited in one of the local banks at interest. The bank to be selected by the President of the Branch.

A letter was read from Dr. Arno Viehoever calling attention to some recent statements in a lecture by Dr. Chevaleir Jackson. These statements were discussed thoroughly and resulted in the following resolutions being passed by the Branch.

"WHEREAS, an erroneous impression appears to have arisen concerning the attitude of pharmacists toward legislation which would require that containers for Caustic Lye, or combinations thereof, be so labeled as to warn prospective purchasers of the dangerous character of the contents, and

"WHEREAS, pharmacists do not oppose specific legislation designed to warn the public of the deadly character of Caustic Lye, therefore

"*Be it resolved* by the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, that we express our full approval of such legislation as will compel packers of Caustic Lye or combinations thereof—under whatever name—which will endanger human life and health if swallowed, to label such containers with distinctive type, signs and symbols which will declare in unmistakable manner the dangerous and deadly character of the contents thereof, and *be it further*

"*Resolved*, that we urge that any bill which is designed to accomplish the foregoing purpose be couched in clear, concise language and limited in its scope to the object to be attained in order that its provision may be intelligently applied and adequately enforced in the event of its enactment into law."

A brief discussion was given to the Cosmetic Bill which has recently appeared in several States, but no action was taken by the Branch upon this bill.

Mr. Hawkins, a representative of the W. C. A. U. Broadcasting Station arrived at this time and spoke briefly to the Branch upon the policy of the stations in broadcasting advertisements. This question was listed on the Branch's program for the evening with discussion to be led by Joseph W. E. Harrisson, who had corresponded with several of the broadcasting stations in question, and as a result of his correspondence Mr. Hawkins came to the meeting to present the case of the stations. The point in question was as to the propriety of certain types of broadcasting which had been going on recently and, in fact, for some time, whereby certain proprietary remedies were advertised through the radio broadcasting stations in such a way as to mislead the public. The Branch took issue with this type of advertising and considerable discussion developed over it. As a result of Mr. Harrisson's efforts a number of firms declared that they would change their methods and we feel that the situation will be better from now on.

Rev. J. J. Joyce Moore was unanimously elected to honorary membership in the Branch. Rev. Moore whose father was a well-known pharmacist in the city has himself shown intense interest in Pharmacy and had recently rendered the Branch some special services.

Mr. Hunsberger brought up the question of the difficulty arising between the Prohibition Enforcement laws and the State Pharmacy Law in regard to the handling of liquor prescriptions. The State law requires that all prescriptions be held by the pharmacist for a period of five years and the Prohibition Enforcement law recently required that all liquor prescriptions be sent to the prohibition office once a month for checking. After a

thorough discussion the following resolution was passed:

WHEREAS, a regulation of the Federal Prohibition Act requires that forms 1403, being prescriptions covering the sale of intoxicating liquor be returned to the prohibition office having jurisdiction, and

WHEREAS, the Act which regulates the practice of Pharmacy in Pennsylvania requires that all prescriptions compounded shall be retained in the druggists' files for a period of five years, and

WHEREAS, it is not apparent that said forms serve any useful purpose in a drug store after having been receipted for and checked by the Prohibition Office, *therefore*

Be it resolved by the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION that we sanction an amendment to the Pennsylvania Pharmacy Law exempting from its provisions, prescriptions covering the dispensing of liquor for individual purposes under permit issued in accord with the provisions of the Federal Prohibition Act, and designated as form 1403.

The program and entertainment for the March meeting were discussed, and it was decided to leave the program entirely to the Entertainment Committee. The March meeting is the annual meeting at which the Past-Presidents are invited as guests of the Branch, and election of officers is also held at this time.

President Cliffe appointed the Committee on Nominations as follows:

Ambrose Hunsberger, *Chairman;* Mrs. Bertha Peacock and John J. Kelly.

The Auditing Committee was also appointed as follows:

Prof. F. P. Stroup, *Chairman*, and Leo G. Penn.

The usual enjoyable dinner was held at the Touraine Apartments Restaurant in the early part of the evening.

ADLEY B. NICHOLS, *Secretary.*

PITTSBURGH.

The following officers were elected at the January meeting of the Pittsburgh Branch:

President, Frank S. McGinnis.
Vice-President, John G. Rees.
Secretary, Louis Saalbach.
Treasurer, P. Henry Utech.
Delegate to House of Delegates, Louis Emanuel.

The balance of the evening was devoted to a prescription clinic under the direction of Frank S. McGinnis.

The February meeting was held Tuesday, the 15th, when the topic of the evening was "The Turtle as a Laboratory Animal with a Demonstration on the Isolated Heart" by Prof. E. C. Reif.

It was decided that the next meeting shall be preceded by a dinner, after which we will have a debate on the subject of "Price Maintenance." The debate will be under the direction of Prof. C. Leonard O'Connell. The debaters will be chosen from the Junior Class.

LOUIS SAALBACH, *Secretary.*

UNIVERSITY OF WASHINGTON.

The February meeting of the University of Washington Branch, A. PH. A., was held Thursday, February 25th, at Bagley Hall. Due to the absence of President Rising, Dean Johnson introduced the speaker, Mr. J. H. Whittlesy, Assistant Manager of Stewart & Holmes, wholesale druggists of Seattle. Mr. Whittlesy presented an interesting talk on the locating, equipping and stocking of a drug store. He mentioned the conditions influencing the choice of location; then the ratio of investment in fixtures and stock. He further analyzed the proportional investment in stock, as far as the sub-divisions were concerned. This was followed by information, on keeping up stock, buying and making displays. He emphasized the need of knowing the stock, of fair treatment to clerks, of service to customer and community, all of which was of interest to the audience and too detailed to mention here.

Dean Johnson led the discussion, calling attention to the value of developing those traits which characterize "dependability," during their college years, inasmuch as they were necessary, if a druggist wished to be successful in carrying out the suggestions outlined by the speaker.

H. A. LANGENHAN, *Secretary.*

A HALF CENTURY OF THE NATIONAL FORMULARY, 1880–1930.

BY H. A. LANGENHAN.

(*Continued from p. 180, Feb.* JOUR. A. PH. A.)

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
Syrupus Pini Strobi Compositus cum Morphinæ	..	..	..	..	..	..	..	..	..	..	..	S
Compound Syrup of White Pine with Morphine	..	..	..	..	..	..	..	..	..	..	E	..
SYRUPUS PINI STROBI COMPOSITUS	..	..	..	..	..	..	..	..	L	L	..	..
Compound Syrup of White Pine	..	..	..	..	..	..	..	..	E	E	..	..
Syr. Pin. Alb. c. Morph.	..	..	..	..	..	..	..	..	..	..	..	A
Syr. Pin. Strob. c. Morph.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS QUINIDINÆ	..	..	..	..	..	..	..	..	..	L	L	L
Syrup of Quinidine	..	..	..	..	..	..	..	..	..	E	E	E
Bitterless Syrup of Quinidine	..	..	..	..	..	..	..	..	..	S	S	S
Syr. Quinid.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS RHAMNI CATHARTICÆ	229	..	229	..	..	..	..	L	L	L	L	L
Syrup of Rhamnus Cathartica	..	..	..	..	..	..	..	E	E	E	E	E
Syrup of Buckthorn Berries	..	..	..	..	..	..	..	S	S	S	S	S
Syrupus Spinæ Cervinæ	..	..	..	..	..	..	..	S	S	S	S	S
Syr. Rham. Cathart.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS RHEI ET POTASSII COMPOSITUS	..	..	..	..	..	..	..	..	L	L	..	..
Compound Syrup of Rhubarb and Potassa	..	..	..	..	..	..	..	..	E	E	..	..
Neutralizing Cordial	..	..	..	..	..	..	..	..	S	S	..	..
SYRUPUS ROSÆ	..	..	..	..	..	230	230	230	230	230	L	L
Syrup of Rose	..	..	..	..	..	..	..	..	..	..	E	E
Syr. Ros.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS RUBI	..	..	..	..	..	231	231	231	231	231	L	L
Syrup of Rubus	..	..	..	..	..	..	..	..	..	..	E	E
Syr. Rubi	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS RUBI AROMATICUS	..	..	..	..	..	..	..	L	L	L	..	..
Aromatic Syrup of Blackberry	..	..	..	..	..	..	..	E	E	E	..	..
SYRUPUS RUBI FRUCTUS	..	..	..	..	..	..	..	..	..	..	L	..
Syrup of Blackberry Fruit	..	..	..	..	..	..	..	..	..	..	E	..
Syr. Rub. Fruct.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS RUBI IDÆI	..	..	..	..	..	..	..	232	232	L	L	L
Syrup of Raspberry	..	..	..	..	..	..	..	..	..	E	E	E
Syr. Rubi Id.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS SANGUINARIÆ	..	..	..	..	..	..	..	L	L	L	L	..
Syrup of Sanguinaria	..	..	..	..	..	..	..	E	E	E	E	..
Syrup of Bloodroot	..	..	..	..	..	..	..	..	S	S	S	..
Syr. Sanguinar.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS SENNÆ AROMATICUS	..	..	..	..	..	..	..	L	L	L	L	L
Aromatic Syrup of Senna	..	..	..	..	..	..	..	E	E	E	E	E
Syr. Senn. Arom.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS SENNÆ COMPOSITUS	..	..	..	..	..	..	..	L	L	L	L	..
Compound Syrup of Senna	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Senn. Co.	..	..	..	..	..	..	..	..	..	..	A	..

229—See **SYRUPUS RHAMNI.**
230—See **SYRUPUS ROSÆ,** U. S. P.
231—See **SYRUPUS RUBI,** U. S. P.
232—See **SYRUPUS RUBI IDÆI,** U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SYRUPUS SODII HYPOPHOSPHITUS	..	..	..	..	..	..	..	L	L	L	L	..
Syrup of Sodium Hypophosphite	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Sod. Hypophos.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS STILLINGIÆ COMPOSITUS	..	..	..	..	..	..	..	L	L	L	L	L
Compound Syrup of Stillingia	..	..	..	..	..	..	..	E	E	E	E	E
Syr. Stilling. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS THYMI	..	..	..	..	..	..	..	..	..	..	..	L
Syrup of Thyme	..	..	..	..	..	..	..	..	..	..	..	E
Syr. Thymi	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS THYMI COMPOSITUS	..	..	..	..	..	..	..	..	..	..	..	L
Compound Syrup of Thyme	..	..	..	..	..	..	..	..	..	..	..	E
Syr. Thymi. Co.	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS TRIFOLII COMPOSITUS	..	..	..	..	..	..	..	..	..	..	..	L
Compound Syrup of Trifolium	..	..	..	..	..	..	..	..	..	..	..	E
Syr. Trifol. Co.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ	..	..	..	..	..	..	..	..	..	..	..	L
Tablets	..	..	..	..	..	..	..	..	..	..	..	E
TABELLÆ CARBONIS ANIMALIS	..	..	..	..	..	..	..	..	..	..	k	L
Tablets of Animal Charcoal	..	..	..	..	..	..	..	..	..	..	..	E
Tablets of Charcoal	..	..	..	..	..	..	..	..	..	..	..	S
Tab. Carb. Anim.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ HYDRARGYRI CHLORIDI MITIS	..	..	..	..	..	..	..	..	..	..	..	L
Tablets of Mild Mercurous Chloride	..	..	..	..	..	..	..	..	..	..	..	E
Calomel Tablets	..	..	..	..	..	..	..	..	..	..	..	S
Tab. Hydrarg. Chlor. Mit.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ PHENOLPHTHALEINI	..	..	..	..	..	..	..	..	..	..	l	L
Tablets of Phenolphthalein	..	..	..	..	..	..	..	..	..	..	..	E
Tab. Phenolphthal.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ SANTONINI	..	..	..	..	..	..	..	..	..	..	m	L
Tablets of Santonin	..	..	..	..	..	..	..	..	..	..	..	E
Tab. Santonin	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ SANTONINI COMPOSITÆ	..	..	..	..	..	..	..	..	..	..	n	L
Compound Tablets of Santonin	..	..	..	..	..	..	..	..	..	..	..	E
Tablets of Santonin and Calomel	..	..	..	..	..	..	..	..	..	..	..	S
Tab. Santonin. Co.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ SODII BICARBONATIS	..	..	..	..	233	233	233	233	233	233	233	L
Tablets of Sodium Bicarbonate	..	..	..	..	..	..	..	..	..	..	..	E
Soda-Mint Tablets	..	..	..	..	..	..	..	..	..	..	..	S
Tab. Sod. Bicarb.	..	..	..	..	..	..	..	..	..	..	..	A
TABELLÆ SULPHURIS ET POTASSII BITARTRATIS	..	..	..	..	..	..	..	..	..	..	o	L
Tablets of Sulphur and Potassium Bitartrate	..	..	..	..	..	..	..	..	..	..	..	E
Tablets of Sulphur and Cream of Tartar	..	..	..	..	..	..	..	..	..	..	..	S
Tab. Sulphur. et Pot. Bitart.	..	..	..	..	..	..	..	..	..	..	..	A

k—Replacing **TROCHISCI CARBONIS LIGNI**, N. F.
l—Replacing **TROCHISCI PHENOLPHTHALEINI**, N. F.
m—Replacing **TROCHISCI SANTONINI**, N. F.
n—Replacing **TROCHISCI SANTONINI COMPOSITÆ**, N. F.
233—Replacing **TROCHISCI SODII BICARBONATIS**, U. S. P.
o—Replacing **TROCHISCI SULPHURIS ET POTASSII BITARTRATIS**, N. F.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
TINCTURA ÆTHEREÆ	..	..	..	..	..	..	..	L	..	..	..	..
Ethereal Tinctures	..	..	..	..	..	..	..	E	..	..	..	..
TINCTURÆ	..	..	..	..	..	..	..	..	..	..	..	L
Tinctures	..	..	..	..	..	..	..	..	..	..	..	E
TINCTURA ACONITI FLEMING	..	..	..	..	..	..	..	L	L	L	..	..
Fleming's Tincture of Aconite	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURA ALOES	234	234	..	234	234	234	234	234	234	234	234	L
Tincture of Aloe	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Aloes	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA ALOES ET MYRRHÆ	235	235	235	235	235	235	235	235	235	235	L	L
Tincture of Aloes and Myrrh	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Aloe. et Myrrh	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA AMARA	..	..	..	..	..	..	..	L	L	L	L	L
Bitter Tincture	..	..	..	..	..	..	..	E	E	E	E	E
Stomachic Tincture	..	..	..	..	..	..	..	S	S	S	S	S
Bitter Stomachic Drops	..	..	..	..	..	..	..	S	S	S	S	S
Stomach Drops	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Amar	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURA ANTACRIDA	..	..	..	..	..	..	..	L	L	L	..	..
Antacrid Tincture	..	..	..	..	..	..	..	E	E	E	..	..
Dysmenorrhœa Mixture	..	..	..	..	..	..	..	S	S	S	..	..
Fenner's Guaiac Mixture	..	..	..	..	..	..	..	S	S	S	..	..
TINCTURA ANTIMONII	..	..	..	..	..	..	..	..	..	..	p	L
Tincture of Antimony	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Antimon	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA ANTIPERIODICA	..	..	..	..	..	..	..	..	L	L	L	L
Antiperiodic Tincture	..	..	..	..	..	..	..	..	E	E	E	E
Warburg's Tincture	..	..	..	..	..	..	..	..	S	S	S	S
Tr. Antiperiod	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA ANTIPERIODICA SINE ALOE	..	..	..	..	..	..	..	..	..	L	L	L
Antiperiodic Tincture without Aloes	..	..	..	..	..	..	..	..	..	E	E	E
Warburg's Tincture without Aloes	..	..	..	..	..	..	..	..	..	S	S	S
Tr. Antiperiod. s. Aloe	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA ARNICÆ	..	..	..	..	..	236	236	236	236	236	236	L
Tincture of Arnica	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Arnic	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA AROMATICA	..	..	..	..	..	..	..	L	L	L	L	L
Aromatic Tincture	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Arom	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA ARNICÆ RADICIS	..	..	..	..	..	..	..	237	237	L	..	..
Tincture of Arnica Root	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA BRYONIÆ	..	..	..	..	..	..	..	238	238	L	L	L
Tincture of Bryonia	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Bryon	..	..	..	..	..	..	..	..	..	..	A	A

234—See **TINCTURA ALOES**, U. S. P.
235—See **TINCTURA ALOES ET MYRRHÆ**, U. S. P.
p—Replacing **VINUM ANTIMONII**, N. F.
236—See **TINCTURA ARNICÆ**, U. S. P.
237—See **TINCTURA ARNICÆ RADICIS**, U. S. P.
238—See **TINCTURA BRYONIÆ**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
TINCTURA CACTI GRANDIFLORI	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Cactus Grandiflorus	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Cact. Grand.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA CALENDULÆ	..	..	..	..	..	..	..	239	239	239	L	L
Tincture of Calendula	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Calend.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA CAPSICI ET MYRRHÆ	..	..	..	..	..	..	..	L	L	L	L	L
Tincture of Capsicum and Myrrh	..	..	..	..	..	..	..	E	E	E	E	E
Hot Drops	..	..	..	..	..	..	..	S	S	S	S	S
Thomsonian Number Six	..	..	..	..	..	..	..	..	..	..	S	S
Tr. Capsic. et Myrrh.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA CARAMELLIS	..	..	..	..	..	..	..	..	..	..	L	..
Tincture of Caramel	..	..	..	..	..	..	..	..	..	..	E	..
TINCTURA CHIRATÆ	..	..	..	..	..	..	..	240	240	L	..	..
Tincture of Chirata	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA CIMICIFUGÆ	..	..	..	..	..	..	..	241	241	241	L	L
Tincture of Cimicifuga	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Cimicif.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA CINNAMOMI	242	242	242	242	242	242	242	242	242	242	242	L
Tincture of Cinnamon	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Cinnam.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA CINCHONÆ DETANNATA	..	..	..	..	..	..	..	L	L	L	..	..
Detannated Tincture of Cinchona	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURA CONII	..	..	..	243	243	243	243	243	L	L	..	..
Tincture of Conium	..	..	..	..	..	..	..	..	E	E	..	..
TINCTURA COCCULI INDICI	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Cocculus Indicus	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Coccul. Ind.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA COLCHICI CORMI FORTIOR	..	..	..	..	..	..	..	..	..	q	q	L
Stronger Tincture of Colchicum Corm.	..	..	..	..	..	..	..	..	..	..	..	E
TINCTURA CRESOLI SAPONATA	..	..	..	..	..	..	..	..	..	L	..	..
Saponated Tincture of Cresol	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA CROCI	..	..	..	..	..	..	..	244	244	L	L	L
Tincture of Saffron	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Croc.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA CUBEBÆ	..	..	..	245	245	245	245	245	245	L	L	L
Tincture of Cubeb	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Cubeb.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA DELPHINI	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Larkspur	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Delphin.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA ERGOTÆ AMMONIATA	..	..	..	..	..	..	..	..	..	..	L	..
Ammoniated Tincture of Ergot	..	..	..	..	..	..	..	..	..	..	E	..
Tr. Ergot. Ammon.	..	..	..	..	..	..	..	..	..	..	A	..

239—See **TINCTURA CALENDULÆ**, U. S. P.
240—See **TINCTURA CHIRATÆ**, U. S. P.
241—**TINCTURA CIMICIFUGÆ**, U. S. P.
242—**TINCTURA CINNAMOMI**, U. S. P.
243—**TINCTURA CONII**, U. S. P.
q—Replacing **VINUM COLCHICI CORMI**, N. F.
244—See **TINCTURA CROCI**, U. S. P.
245—See **TINCTURA CUBEBÆ**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
TINCTURA FERRI CHLORIDI ÆTHEREA	..	..	..	..	..	..	..	L	L	L	L	L
Ethereal Tincture of Ferric Chloride	..	..	..	..	..	..	..	E	E	E	E	E
Bestuscheff's Tincture	..	..	..	..	..	..	..	S	S	S	S	S
Lamotte's Drops	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Ferr. Chlor. Æth.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA FERRI CITRO-CHLORIDI	..	..	..	..	..	..	..	L	L	L	L	L
Tincture of Ferric Citro Chloride	..	..	..	..	..	..	..	E	E	E	E	E
Tasteless Tincture of Ferric Chloride	..	..	..	..	..	..	..	S	S	S	S	S
Tasteless Tincture of Iron	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Ferr. Citro-Chlor.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA FERRI POMATA	..	..	..	..	..	..	..	L	L	L	L	L
Tincture of Ferrated Extract of Apples	..	..	..	..	..	..	..	E	E	E	E	E
Tinctura Ferri Malatis Crudi	..	..	..	..	..	..	..	S	S	S	S	S
Tincture of Crude Malate of Iron	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Ferr. Pomat.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA GALLÆ	..	..	..	246	246	246	246	246	246	246	L	L
Tincture of Nutgall	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Gall.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA GELSEMII	..	..	..	..	..	..	..	247	247	247	247	L
Tinctura of Gelsemium	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Gelsem.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA GUAIACI	248	248	248	248	248	248	248	248	248	248	248	L
Tincture of Guaiac	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Guaiac.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA GUAIACI AMMONIATA	249	249	249	249	249	249	249	249	249	249	249	L
Ammoniated Tincture of Guaiac	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Guaiac. Ammon.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA GUAIACI COMPOSITA	..	..	..	..	..	..	..	L	L	L	L	L
Compound Tincture of Guaiac	..	..	..	..	..	..	..	E	E	E	E	E
Dewee's Tincture of Guaiac	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Guaiac. Co.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA HUMULI	250	250	250	250	250	250	250	250	250	L	L	L
Tinctura of Hops	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Humul.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA HYDRASTIS	..	..	..	..	..	..	..	251	251	251	251	L
Tincture of Hydrastis	..	..	..	..	..	..	..	..	..	..	..	E
Tincture of Goldenseal	..	..	..	..	..	..	..	..	..	..	..	S
Tr. Hydrast.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA IGNATIÆ	..	..	..	..	..	..	..	252	L	L	L	L
Tincture of Ignatia	..	..	..	..	..	..	..	..	E	E	E	E
Tr. Ignat.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA IODIDORUM	..	..	..	..	..	..	..	..	..	..	..	L
Tincture of Iodides	..	..	..	..	..	..	..	..	..	..	..	E
TINCTURA IODI DECOLORATA	..	..	..	..	..	..	..	L	L	L	L	..
Tinctura Iodi Decolorata	..	..	..	..	..	..	..	..	..	..	..	S

246—See **TINCTURA GALLÆ**, U. S. P.
247—See **TINCTURA GELSEMII**, U. S. P.
248—See **TINCTURA GUAIACI**, U. S. P.
249—See **TINCTURA GUAIACI AMMONIATA**, U. S. P.
250—See **TINCTURA HUMULI**, U. S. P.
251—See **TINCTURA HYDRASTIS**, U. S. P.
252—See **TINCTURA IGNATIÆ**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
Decolorized Tinctura of Iodine	..	..	..	..	..	..	..	E	E	E	E	..
Decolorized Tincture of Iodine	..	..	..	..	..	..	..	..	..	..	..	S
Tr. Iod. Decolor.	..	..	..	..	..	..	..	..	..	..	A	..
Tr. Iodidor.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA IODI FORTIOR	..	..	..	253	253	253	253	..	..	..	L	L
Stronger Tincture of Iodine	..	..	..	..	..	..	..	..	..	..	E	E
Churchill's Tincture of Iodine	..	..	..	..	..	..	..	E	E	E	..	..
Churchill's Tincture of Iodine	..	..	..	..	..	..	..	..	..	..	S	S
TINCTURA IODI, CHURCHILL	..	..	..	..	..	..	..	L	L	L	..	..
Tr. Iod. Fort.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA IPECACUANHÆ	..	..	..	..	..	..	..	..	..	..	..	L
Tincture of Ipecac.	..	..	..	..	..	..	..	..	..	..	..	E
Tinct. Ipecac.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA IPECACUANHÆ ET OPII	..	..	..	..	..	..	..	254	254	254	L	L
Tincture of Ipecac and Opium	..	..	..	..	..	..	..	..	..	..	E	E
Tincture of Dover's Powder	..	..	..	..	..	..	..	..	..	..	S	S
Tr. Ipecac. et Opii	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA JALAPÆ	255	255	255	255	255	255	255	L	L	L	L	L
Tincture of Jalap	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Jalap.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA JALAPÆ COMPOSITA	..	..	..	..	..	..	..	L	L	L	L	L
Compound Tincture of Jalap	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Jalap. Co.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA KINO ET OPII COMPOSITA	..	..	..	..	..	..	..	..	..	..	L	..
Compound Tincture of Kino and Opium	..	..	..	..	..	..	..	..	..	..	E	..
TINCTURA KINO COMPOSITA	..	..	..	..	..	..	..	L	L	L	..	..
Tinctura Kino Composita	..	..	..	..	..	..	..	..	..	..	S	..
Compound Tincture of Kino	..	..	..	..	..	..	..	E	E	E	..	..
Compound Tincture of Kino	..	..	..	..	..	..	..	..	..	..	S	..
Tr. Kino et Opii Co.	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURA KRAMERIÆ	..	..	..	256	256	256	256	256	256	256	L	..
Tincture of Krameria	..	..	..	..	..	..	..	..	..	..	E	..
Tr. Kramer.	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURA MATICO	..	..	..	..	..	..	..	257	257	L	..	..
Tincture of Matico	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA OPII CROCATA	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Opium with Saffron	..	..	..	..	..	..	..	..	..	..	E	E
Sydenhams Laudanum	..	..	..	..	..	..	..	..	..	..	S	S
Tinctura Opii Crocata P. I.	..	..	..	..	..	..	..	..	..	..	S	S
Tr. Opii Crocat.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA OPII ET GAMBIR COMPOSITA	..	..	..	..	..	..	..	..	..	..	..	L
Compound Tincture of Opium and Gambir	..	..	..	..	..	..	..	..	..	..	..	E
TINCTURA PECTORALIS	..	..	..	..	..	..	..	L	L	L	L	..
Tinctura Pectoralis	..	..	..	..	..	..	..	..	..	..	..	S
Pectoral Tincture	..	..	..	..	..	..	..	E	E	E	E	..
Guttæ Pectorales	..	..	..	..	..	..	..	S	S	S	S	S

253—Compare **TINCTURA IODINI COMPOSITA**, U. S. P.
254—See **TINCTURA IPECACUANHÆ ET OPII**, U. S. P.
255—See **TINCTURA JALAPÆ**, U. S. P.
256—See **TINCTURA KRAMERIÆ**, U. S. P.
257—See **TINCTURA MATICO**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
Pectoral Drops	..	..	..	..	..	..	..	S	S	S	S	S
Bateman's Pectoral Drops	..	..	..	..	..	..	..	S	S	S	S	S
Tr. Pectoral	..	..	..	..	..	..	..	..	..	..	A	..
Tr. Opii et Gambir Co.	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA PAPAVERIS	..	..	..	..	..	..	..	L	L	L	..	..
Tincture of Poppy	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURA PARACOTO	..	..	..	..	..	..	..	..	..	..	L	..
Tincture of Paracoto	..	..	..	..	..	..	..	..	..	..	E	..
TINCTURA COTO	..	..	..	..	..	..	..	L	L	L	..	..
Tinctura Coto	..	..	..	..	..	..	..	..	..	..	S	..
Tincture of Coto	..	..	..	..	..	..	..	E	E	E	..	..
Tr. Paracoto	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURA PASSIFLORÆ	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Passion Flower	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Passiflor	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA PERSIONIS	..	..	..	..	..	..	..	L	L	L	L	L
Tincture of Cudbear	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Persion	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA PERSIONIS COMPOSITA	..	..	..	..	..	..	..	L	L	L	L	L
Compound Tincture of Cudbear	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Persion. Co.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA PIMPINELLÆ	..	..	..	..	..	..	..	L	L	L	L	..
Tincture of Pimpinella	..	..	..	..	..	..	..	E	E	E	E	..
Tr. Pimpinel	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURA PULSATILLÆ	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Pulsatilla	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Pulsatil	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA QUASSIÆ	258	258	..	258	258	258	258	258	258	258	258	L
Tincture of Quassia	..	..	..	..	..	..	..	..	..	..	..	E
Tr. Quas	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA QUILLAJÆ	..	..	..	..	..	..	..	L	259	259	L	L
Tincture of Quillaja	..	..	..	..	..	..	..	E	..	..	E	E
Tr. Quillaj	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA RHEI AQUOSA	..	..	..	..	..	..	..	L	L	L	L	L
Aqueous Tincture of Rhubarb	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Rhei. Aq.	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA RHEI DULCIS	260	..	..	..	..	..	..	260	260	L	L	L
Sweet Tincture of Rhubarb	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Rhei. Dulc	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA RHEI ET GENTIANÆ	261	261	..	261	261	..	..	L	L	L	L	L
Tincture of Rhubarb and Gentian	..	..	..	..	..	..	..	E	E	E	E	E
Tr. Rhei et Gent	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA RHEI VINOSA	..	..	..	..	..	..	..	L	L	L	r	..
Vinous Tincture of Rhubarb	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURA SABAL ET SANTALI	..	..	..	..	..	..	..	..	..	..	L	L
Tincture of Saw Palmetto and Santal	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Sabal. et Santal	..	..	..	..	..	..	..	..	..	..	A	A

258—See **TINCTURA QUASSIÆ**, U. S. P.
259—See **TINCTURA QUILLAJÆ**, U. S. P.
260—See **TINCTURA RHEI DULCIS**, U. S. P.
261—See **TINCTURA RHEI ET GENTIANÆ**, U. S. P.
r—See **VINUM RHEI COMPOSITUM**, N. F.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
TINCTURA SANGUINARIÆ	262	262	262	262	262	262	262	262	262	262	262	L
Tincture of Sanguinaria	..	..	..	..	..	..	..	..	..	..	..	E
Tincture of Bloodroot	..	..	..	..	..	..	..	..	..	..	..	S
Tr. Sanguin	..	..	..	..	..	..	..	..	..	..	..	A
TINCTURA SAPONIS VIRIDIS COMPOSITUS	..	..	..	..	..	..	..	L	L	L	s	s
Compound Tincture of Green Soap	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURA SERPENTARIÆ	263	263	..	263	263	263	263	263	263	263	L	L
Tincture of Serpentaria	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Serpent	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA STRAMONII SEMINIS	264	264	264	264	264	264	264	264	264	L	..	..
Tincture of Stramonium Seed	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA STROPHANTI	..	..	..	..	..	..	..	L	265	265	265	265
Tincture of Strophanthus	..	..	..	..	..	..	..	E	..	..	..	..
TINCTURA SUMBUL	..	..	..	..	..	..	..	266	266	L	L	L
Tincture of Sumbul	..	..	..	..	..	..	..	..	..	E	E	E
Tr. Sumbul	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA TOLUTANA ÆTHEREA	..	..	..	..	..	..	..	..	..	L	..	..
Ethereal Tincture of Tolu	..	..	..	..	..	..	..	..	..	E	..	..
TINCTURA TOLUTANA SOLUBILIS	..	..	..	..	..	..	..	L	L	L	..	..
Soluble Tincture of Tolu	..	..	..	..	..	..	..	E	E	E	..	..
TINCTURE OF VANILLÆ	..	..	..	..	..	..	..	267	267	267	L	L
Tincture of Vanilla	..	..	..	..	..	..	..	..	..	..	E	E
Tr. Vanill	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA VANILLINI COMPOSITA	..	..	..	..	..	..	..	L	L	L	..	..
Compound Tincture of Vanillin	..	..	..	..	..	..	..	E	E	E	..	..
Compound Essence of Vanillin	..	..	..	..	..	..	..	S	S	S	..	..
TINCTURA VIBURNI OPULI COMPOSITA	..	..	..	..	..	..	..	..	L	L	L	L
Compound Tincture of Viburnum	..	..	..	..	..	..	..	..	E	E	E	E
Tr. Viburn. Opul. Co	..	..	..	..	..	..	..	..	..	..	A	A
TINCTURA ZEODARIÆ AMARA	..	..	..	..	..	..	..	L	L	L	L	..
Bitter Tincture of Zeodary	..	..	..	..	..	..	..	E	E	E	E	..
Compound Tincture of Zeodary	..	..	..	..	..	..	..	S	S	S	S	..
Tr. zeodoar. Amar	..	..	..	..	..	..	..	..	..	..	A	..
TINCTURÆ ÆTHEREÆ	..	..	..	..	..	..	..	..	L	L	L	L
Ethereal Tincture	..	..	..	..	..	..	..	..	E	E	E	E
TINCTURÆ MEDICAMENTORUM RECENTIUM	..	..	..	..	..	..	..	..	..	..	L	L
Tinctures of Fresh Drugs	..	..	..	..	..	..	..	..	..	..	E	E
Tincturæ Herbarum Recentium	..	..	..	..	..	..	..	..	..	..	S	S
TINCTURÆ	..	..	..	..	..	..	..	..	..	L	L	L
Tinctures	..	..	..	..	..	..	..	..	..	E	E	E
TROCHISCI CARBONIS LIGNI	..	..	..	..	..	..	..	..	..	..	L	t
Troches of Charcoal	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Carb. Lig	..	..	..	..	..	..	..	..	..	..	A	..

262—See **TINCTURA SANGUINARIÆ**, U. S. P.
s—See **LINIMENTUM SAPONIS VIRIDIS. COMP.**, N. F.
263—See **TINCTURA SERPENTARIÆ**, U. S. P.
264—See **TINCTURA STRAMONII SEMINIS**, U. S. P.
265—See **TINCTURA STROPHANTHI**, U. S. P.
266—See **TINCTURA SUMBUL**, U. S. P.
267—See **TINCTURA VANILLÆ**, U. S. P.
t—See **TABELLÆ CARBONIS ANIMALIS.**

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
TROCHISCI CATECHU	..	..	..	..	..	..	..	268	268	L	..	..
Troches of Catechu	..	..	..	..	..	..	..	..	..	E	..	..
TROCHISCI CRETÆ	269	269	269	269	269	269	269	269	269	L	..	..
Troches of Chalk	..	..	..	..	..	..	..	..	..	E	..	..
TROCHISCI EUCALYPTI GUMMI	..	..	..	..	..	..	..	..	..	..	..	L
Troches of Eucalyptus Gum	..	..	..	..	..	..	..	..	..	..	..	E
Troches of Red Gum	..	..	..	..	..	..	..	..	..	..	..	S
Troch. Eucalypt. Gum	..	..	..	..	..	..	..	..	..	..	..	A
TROCHISCI FERRI	..	..	..	..	..	..	..	270	270	L	..	..
Troches of Iron	..	..	..	..	..	..	..	..	..	E	..	..
TROCHISCI GAMBIR	..	..	..	..	..	..	..	..	..	271	L	..
Troches of Gambir	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Gambir	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI IPECACUANHÆ	..	..	..	272	272	272	272	272	272	L	..	..
Troches of Ipecac	..	..	..	..	..	..	..	..	..	E	..	..
TROCHISCI MAGNESIÆ	273	273	273	273	273	273	273	273	L	L	..	..
Troches of Magnesia	..	..	..	..	..	..	..	..	E	E	..	..
TROSCHISCI MENTHÆ PIPERITÆ	..	..	..	274	274	274	274	274	274	L	L	..
Troches of Peppermint	..	..	..	..	..	..	..	..	..	E	E	..
Troch. Menth. Pip.	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI PHENOLPHTHALEINI	..	..	..	..	..	..	..	..	..	..	L	u
Troches of Phenolphthalein	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Phenolphthal	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI MORPHINÆ ET IPECACUANHÆ	..	..	..	..	..	..	275	275	275	L	..	..
Troches of Morphine and Ipecac	..	..	..	..	..	..	..	..	..	E	..	..
TROCHISCI QUININÆ TANNATIS	..	..	..	..	..	..	..	..	..	..	L	..
Troches of Quinine Tannate	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Quin. Tan	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI SANTONINI	..	..	..	..	..	..	276	..	276	276	L	v
Troches of Santonin	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Santonin	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI SANTONINI COMPOSITI	..	..	..	..	..	..	..	..	..	..	L	w
Compound Troches of Santonin	..	..	..	..	..	..	..	..	..	..	E	..
Troches of Santonin and Calomel	..	..	..	..	..	..	..	..	..	..	S	..
Troch. Santonin. Co	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI SODII SANTONINATIS	..	..	..	..	..	..	..	277	L	L	..	..
Troches of Sodium Santoninate	..	..	..	..	..	..	..	..	E	E	..	..
TROCHISCI SULPHURIS ET POTASSII BITARTRATIS	..	..	..	..	..	..	..	..	..	..	L	x

268—See **TROCHISCI CATECHU**, U. S. P.
269—See **TROCHISCI CRETÆ**, U. S. P.
270—See **TROCHISCI FERRI**, U. S. P.
271—See **TROCHISCI GAMBIR**, U. S. P.
272—See **TROCHISCI IPECACUANHÆ**, U. S. P.
273—See **TROCHISCI MAGNESIÆ**, U. S. P.
274—See **TROCHISCI MENTHÆ PIPERITÆ**, U. S. P.
u—See **TABELLÆ PHENOLPHTHALEINI**, N. F.
275—See **TROCHISCI MORPHINÆ ET IPECACUANHÆ**, U. S. P.
276—See **TROCHISCI SANTONINI**, U. S. P.
v—See **TABELLÆ SANTONINI**, N. F.
w—See **TABELLÆ SANTONINI COMPOSITUS**, N. F.
277—See **TROCHISCI SODII SANTONINATIS**, U. S. P.
x—See **TABELLÆ SULPHURIS ET POTASSII BITARTRATIS**, N. F.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
Troches of Sulphur and Cream of Tartar	..	..	..	..	..	..	..	..	..	..	S	..
Troches of Sulphur and Potassium Bitartrate	..	..	..	..	..	..	..	..	..	..	E	..
Troch. Sulphur. et Pot. Bitart.	..	..	..	..	..	..	..	..	..	..	A	..
TROCHISCI ULMI	..	..	..	..	..	..	..	..	..	..	L	L
Troches of Elm	..	..	..	..	..	..	..	..	..	..	E	E
Troch. Ulmi	..	..	..	..	..	..	..	..	..	..	A	A
TROCHISCI ZINGIBERIS	..	..	..	..	..	278	278	278	278	L	..	..
Troches of Ginger	..	..	..	..	..	..	..	..	..	E	..	..
UNGUENTUM ACIDI GALLICI	..	..	..	..	..	..	..	279	L	L	..	..
Ointment of Gallic Acid	..	..	..	..	..	..	..	..	E	E	..	..
UNGUENTUM BITUMINIS SULPHONATI	..	..	..	..	..	..	..	..	..	..	..	L
Ointment of Sulphonated Bitumen	..	..	..	..	..	..	..	..	..	..	..	E
Ung. Bitum. Sulphon.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM CALAMINÆ	..	..	..	..	..	..	..	L	L	L	L	L
Calamine Ointment	..	..	..	..	..	..	..	E	E	E	E	E
Unguentum Zinci Carbonatis Crudi	..	..	..	..	..	..	..	S	S	S	S	..
Unguentum Calaminare	..	..	..	..	..	..	..	S	S	S	S	S
Turner's Cerate	..	..	..	..	..	..	..	S	S	S	S	S
Ung. Calamin.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM CAMPHORÆ	..	..	..	..	..	..	..	L	L	L	L	L
Camphor Ointment	..	..	..	..	..	..	..	E	E	E	E	E
Unguentum Camphoratum	..	..	..	..	..	..	..	S	S	S	..	..
Ung. Camph.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM CAPSICI	..	..	..	..	..	..	..	..	..	..	..	L
Capsicum Ointment	..	..	..	..	..	..	..	..	..	..	..	E
Ung. Capsic.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM FUSCUM	..	..	..	..	..	..	..	L	L	L	L	L
Brown Ointment	..	..	..	..	..	..	..	E	E	E	E	E
Unguentum Matris	..	..	..	..	..	..	..	S	S	S	S	S
Mother's Salve	..	..	..	..	..	..	..	S	S	S	S	S
Ung. Fusc.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM HYDRARGYRI CHLORIDI MITIS	..	..	..	..	..	..	..	..	..	..	..	L
Ointment of Mild Mercurous Chloride	..	..	..	..	..	..	..	..	..	..	..	E
Prophylactic Ointment	..	..	..	..	..	..	..	..	..	..	..	S
Calomel Ointment	..	..	..	..	..	..	..	..	..	..	..	S
Ung. Hydrarg. Chlor. Mit.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM HYDRARGYRI NITRATIS	280	280	280	280	280	280	280	280	280	280	280	L
Ointment of Mercuric Nitrate	..	..	..	..	..	..	..	..	..	..	..	E
Citrine Ointment	..	..	..	..	..	..	..	..	..	..	..	S
Ung. Hydrarg. Nit.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM HYDRARGYRI OXIDI RUBRI	281	281	281	281	281	281	281	281	281	281	L	L
Ointment of Red Mercuric Oxide	..	..	..	..	..	..	..	..	..	..	E	E
Ung. Hydrarg. Oxid. Rub.	..	..	..	..	..	..	..	..	..	..	A	A

278—See **TROCHISCI ZINGIBERIS**, U. S. P.
279—See **UNGUENTUM ACIDI GALLICI**, U. S. P.
280—See **UNGUENTUM HYDRARGYRI NITRATIS**, U. S. P.
281—See **UNGUENTUM HYDRARGYRI OXIDI RUBRI**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
UNGUENTUM IODI DENIGRESCENS	..	..	..	..	..	..	..	..	..	..	..	L
Stainless Iodine Ointment	..	..	..	..	..	..	..	..	..	..	..	E
Ung. Iod. Denig.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM MEZEREI	..	..	..	282	282	..	282	282	L	L	..	..
Mezereum Ointment	..	..	..	..	..	..	..	..	E	E	..	..
UNGUENTUM PICIS COMPOSITUM	..	..	..	..	..	..	..	L	L	L	L	L
Compound Tar Ointment	..	..	..	..	..	..	..	E	E	E	E	E
Ung. Pic. Co.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM PLUMBI CARBONATIS	283	283	..	283	283	283	283	283	283	L	..	..
Ointment of Lead Carbonate	..	..	..	..	..	..	..	..	..	E	..	..
UNGUENTUM PLUMBI IODIDI	..	..	..	..	..	..	284	284	284	L	L	L
Ointment of Lead Iodide	..	..	..	..	..	..	..	..	..	E	E	E
Ung. Plumb. Iod.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM POTASSII IODIDI	..	..	..	..	285	285	285	285	285	285	L	L
Ointment of Potassium Iodide	..	..	..	..	..	..	..	..	..	..	E	E
Ung. Pot. Iod.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM RESORCINOLIS COMPOSITUS	..	..	..	..	..	..	..	..	..	L	L	L
Compound Resorcinol Ointment	..	..	..	..	..	..	..	..	..	E	E	E
Unguentum Resorcini Compositum	..	..	..	..	..	..	..	..	..	..	..	S
Soothing Ointment	..	..	..	..	..	..	..	..	..	S	..	..
Ung. Resorcin. Co.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM SINAPIS	..	..	..	..	..	..	..	..	..	..	..	L
Mustard Ointment	..	..	..	..	..	..	..	..	..	..	..	E
Ointment of Oil of Mustard	..	..	..	..	..	..	..	..	..	..	..	S
Ung. Sinap.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM STRAMONII	286	286	286	286	286	286	286	286	286	286	286	L
Stramonium Ointment	..	..	..	..	..	..	..	..	..	..	..	E
Ung. Stramon.	..	..	..	..	..	..	..	..	..	..	..	A
UNGUENTUM SULPHURIS ALKALINUM	..	..	..	..	..	..	..	287	L	L	L	L
Alkaline Sulphur Ointment	..	..	..	..	..	..	..	..	E	E	E	E
Ung. Sulphur. Alk.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM SULPHURIS COMPOSITUM	288	288	288	288	288	..	..	L	L	L	L	L
Compound Sulphur Ointment	..	..	..	..	..	..	..	E	E	E	E	E
Wilkinson's Ointment	..	..	..	..	..	..	..	S	S	S	S	S
Hebra's Itch Ointment	..	..	..	..	..	..	..	S	S	S	S	S
Ung. Sulphur. Co.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM VERATRINÆ	..	..	..	..	..	289	289	289	289	289	L	L
Veratrine Ointment	..	..	..	..	..	..	..	..	..	..	E	E
Ung. Veratrin.	..	..	..	..	..	..	..	..	..	..	A	A
UNGUENTUM ZINCI STEARATIS	..	..	..	..	..	..	..	..	..	290	L	L
Ointment of Zinc Stearate	..	..	..	..	..	..	..	..	..	..	E	E
Ung. Zinc. Stear.	..	..	..	..	..	..	..	..	..	..	A	A

282—See **UNGUENTUM MEZEREI**, U. S. P.
283—See **UNGUENTUM PLUMBI CARBONATIS**, U. S. P.
284—See **UNGUENTUM PLUMBI IODIDI**, U. S. P.
285—See **UNGUENTUM POTASSII IODIDI**, U. S. P.
286—See **UNGUENTUM STRAMONII**, U. S. P.
287—See **UNGUENTUM SULPHURIS ALKALINUM**, U. S. P.
288—See **UNGUENTUM SULPHURIS COMPOSITUM**, U. S. P.
289—See **UNGUENTUM VERATRINÆ**, U. S. P.
290—See **UNGUENTUM ZINCI STEARATIS**, U. S. P.

(*To be continued*)

EDITORIAL NOTES

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RESEARCH ON PHARMACOPŒIAL PROBLEMS.

(*Continued from p. 183, Feb.* JOUR. A. PH. A.)

THE U. S. P. COMMITTEE ON CHEMICAL RESEARCH.

H. V. ARNY, CHAIRMAN, WITH FRANK R. ELDRED, CHARLES H. LAWALL, W. O. RICHTMANN AND GEORGE D. ROSENGARTEN.

1. Tablets—Standards and Assays. Methods for assaying pharmacopœial substances in tablets and general specifications for tablets should be established.

2. Cinchona Assay. The specific details of the assay call for further study.

3. Colorimetric Assay Methods. A study should be made of standardized colorimetric assays for the accurate determination of minute amounts of alkaloids and other active plant principles in pharmaceutical products, such as:

a. The morphine content of paregoric.

b. The assay of digitalis.

4. Alkaloids. A further study is needed of the physical chemistry in the alkaloidal assay of drugs.

5. Assay of Anthraquinone-bearing Drugs. The colorimetric assay methods for anthraquinone drugs call for further investigation. Other proposed methods should also be studied, with the hope of providing a satisfactory assay.

6. Reconsideration of U. S. P. Chemical Tests in the Light of the Present Knowledge of Hydrogen-Ion Concentration.

7. Electrometric Titration of Drugs Containing Alkaloids. To make this method more useful numerous titrations should be made and curves plotted from the results obtained.

8. Assay of Aloe. A satisfactory method for the assay of aloe is needed. It may involve a new study of aloin and its reactions. No satisfactory process is now available.

9. Assay of Oxgall. No satisfactory process is now available. There is evidence of considerable variation in oxgall as regards the glycocholates and "bile salts." What is meant commercially by "bile salts?"

10. Alkaloidal Assays. A further study should be made of the methods suggested for the improvement of the alkaloidal assays of drugs and their preparations as given in the JOUR. A. PH. A., Vol. 1, p. 29 (1912).

11. Capsicum and Oleoresin of Capsicum. An assay method should be developed which would be more definite than the present organoleptic test.

12. Chloroform Liniment. An assay process should be devised and a maximum and minimum standard adopted.

13. Automatic Devices for Extracting Alkaloids. The methods suggested by the Bureau of Chemistry and claimed to be labor-saving and more accurate than those of the U. S. P. X (see *Ind. Eng. Chem.,* 17, 612 (1925)) should be carefully tested, probably by a commission working on common samples.

14. The Assay of Hyoscyamus and Its Preparations. A further study of this assay (U. S. P. X) is desirable.

15. The Assay of Ipecac and Its Preparations. A further study of this assay (U. S. P. X) is desirable.

16. Indicators for Alkaloidal Assays. Work in the Bureau of Chemistry indicates

that in some instances the indicators specified in the Pharmocopœia for alkaloidal assay do not give the correct neutral points. For example, methyl red and cochineal are not suitable for the cinchona alkaloids. This subject should be given further study.

17. Glycyrrhiza. A comparison of suggested assay methods is desirable, with a view of adopting an official method.

18. The Manufacture of Spirit of Ethyl Nitrite. A study of the methods of manufacture, especially with a view of greater stability, is desirable.

19. The Assay of Sodium Cacodylate. The U. S. P. X assay calls for further study.

20. Differentiating Tests for Strong and Mild Silver Protein. A satisfactory chemical test is desirable. Those suggested should be studied and reported upon.

21. Assay of Alkaloidal Salts. This question should receive the immediate attention of the U. S. P. Research Committee. The majority of the alkaloidal salts of the U. S. P. contain water of crystallization. Many of these hydrated salts lose a portion of their water at relatively low temperatures. A notable example of this type is quinine sulphate, which loses all but about two molecules of water at 50 degrees C. or even lower. In conducting the research on alkaloidal assays these facts will have to be taken into consideration.

Another point that will have to be carefully investigated is the indicators to be used. Methyl red is generally considered the most suitable indicator for alkaloids, yet with some alkaloids it apparently gives low results.

22. Cresol. The U. S. P. X specifications for cresol call for a careful investigation, especially giving consideration to uniformity in their phenol-coefficient.

23. Solubilities. The definition of the meaning of "very soluble," "freely soluble," "soluble," etc., in the U. S. P. X is an advance in the direction of greater definiteness and precision. For practical purposes the degree of solubility conveyed by these terms may suffice, yet there may be instances where the solubility expressed by these terms is too indefinite. "Freely soluble," according to the definition, covers a solubility of from 1 to 10 parts. This is rather a wide range for this degree of solubility.

Such somewhat vague information is not in accordance with the other more precise figures for solubility occurring in the same paragraph. More precise statements of solubility will no doubt be appreciated by the users of the Pharmacopœia.

If it is not possible or practicable to give more precise solubilities instead of the solubilities conveyed by the descriptive terms, it is at least important to ascertain that the solubility of the various U. S. P. products in solvents now designated by "very soluble" or "freely soluble" does fall within the range understood by these terms. The first thing to do would be to classify the chemicals for which the descriptive solubilities are given. This should be undertaken as a collaborative study, a number of laboratories taking part in the investigation.

24. Lactic Acid. There is a need for a study of qualitative tests for lactic acid, with particular reference to testing for lactates in the presence of other organic acids.

25. A Study of the Tests for Caramel Color. There is a need for improvements in the tests for the detection of caramel coloring in liquids where it has been added illegally for the purpose of deception.

26. Solution of Epinephrine Hydrochloride. It is suggested that a dependable formula for the 1 to 1000 solution of epinephrine hydrochloride should be included in the U. S. P., giving the degree of acidity, the amount and nature of preservative, the amount and nature of reducing agent to keep the epinephrine from oxidation, etc. Some manufacturers are adding chlorobutanol or other substances as a preservative. This is not provided for in the U. S. P. X and should either be permitted or excluded by tests. The keeping qualities of the solutions and dilutions therefrom should, of course, be determined by recognized methods of physiological assay.

27. Arsenic Trioxide. A study should be made of its solubility in water, especially as to the influence of its physical form upon its solubility.

28. Potassa Sulphurata. A study should be made of its decomposition on aging and the possibilities of stabilizers being introduced.

29. Ammonium Carbonate. A further study on its composition is desirable, with particular reference to the manufacture of aromatic Spirit of Ammonia.

30. Chlorinated Lime. It is desirable that there should be further study of the condition of its "active chlorine."

31. The Pepsin Assay. This assay calls for further study, providing, if possible, a

more suitable sub-strata than egg white and a more definite end-point.

32. The Assay of Volatile Oils. A study of the U. S. P. X assays for the oils of eucalyptus, lemon and santal has been suggested as desirable.

33. Peppermint Oil. Positive tests should be devised for the exclusion of other peppermint oils which might be used as adulterants.

34. Emetine Hydrochloride. Emetine hydrochloride (U. S. P. X) is defined as containing "variable amounts of water of crystallization" and as losing "not more than 19 per cent (water) upon drying." This makes a very unsatisfactory standard, as it permits two products, one of which is only 81 per cent as active as the other, to be sold under the same designation. It is suggested that the article as found in commerce be investigated, with a view to more closely defining the amount of water the product should contain.

35. Isopropyl Alcohol Test in Whisky. A new test should be devised; that in the U. S. P. X will not indicate certain isopropyl alcohols now on the market which are free from tertiary butyl alcohol.

36. Extract of Malt. The rate of deterioration should be studied and the assay improved, if possible.

37. Microchemical Methods. What Microchemical Methods for the identification or assay of plant constituents are applicable to the Pharmacopœial Texts?

THE U. S. P. COMMITTEE ON PHARMACOGNOSTIC RESEARCH.

EDWIN L. NEWCOMB, CHAIRMAN, WITH W. O. RICHTMANN.

1. Microanalytical Descriptions of Vegetable Drugs. A restudy of all U. S. P. X descriptions and terminology is desirable for the purpose of perfecting the text.

2. U. S. P. Color Standards and Color Nomenclature. This subject is one calling for an extensive investigation, of a collaborative character.

3. Standards for the Degree of Fineness in Powdered Drugs. Further research is needed on the degree of fineness of powdered drugs best suited to yield the maximum of therapeutic values most economically and under varying conditions. This means the preparation of samples of known botanical characteristics, of specific degrees of fineness and coöperation with pharmaceutical and assay groups. Work on percolation has heretofore been done with almost a complete disregard of the actual size of particles and the fundamental principles of osmosis.

4. Organic Foreign Material in Vegetable Drugs. Further research should be conducted on the organic foreign material in vegetable drugs for the purpose of adopting blanket standards for these impurities, as has been done for inorganic foreign material in the U. S. P. X.

5. Vegetable Drug Standards. It would greatly facilitate the work of the next U. S. P. revision if a report could be prepared containing recommended changes to bring about greater uniformity, scientific accuracy and completeness for the vegetable drugs of the Pharmacopœia.

6. Changes during the Drying of Vegetable Drugs. It is desirable to determine the changes which take place in the therapeutic values of certain vegetable drugs from the fresh medicinal plant material to the dried drug. This would be possible through cooperative research with the medicinal men on the Committee who are in a position to carry on clinical work, and also with those who are in a position to carry on assay work. One of our more important specific drugs should be selected for intensive study along these lines.

7. The U. S. P. X Alcohol-Soluble Extractive Method. There seems to be some danger of the U. S. P. X method for alcohol-insoluble extractive giving consistently low results. Gum and balsamic resins contain volatile constituents that will be extracted during the alcohol-extractive determination. When this residue is being dried to constant weight at 110 degrees C., the volatile constituents will pass off, together with a small amount of water that may be present in the drug. In the case of Benzoin the volatile constituents are considered of therapeutic value, and preparations of this drug are often used as inhalants.

In the U. S. P. X method for alcohol-soluble extractives the alcohol-soluble material is dried to constant weight, which, of course, is free from the volatile constituents of the gum resin.

The loss in five samples of Benzoin extractive drug drying at 110 degrees C., as directed by the U. S. P. X, was 2.1, 4.98, 3.4, 2.4 and 3.5 per cent, respectively.

The method should be modified to avoid

this error, possibly through a check against the dry insoluble residue.

THE U. S. P. RESEARCH COMMITTEE ON PHARMACEUTICAL FORMULAS AND PROCESSES.

WILBUR L. SCOVILLE, CHAIRMAN, WITH GEORGE M. BERINGER AND JACOB DINER.

1. Compound Mixture of Glycyrrhiza. It has been reported that rapid decomposition of the ethyl nitrite occurs when using the U. S. P. X formula for this mixture, gas being liberated and all ethyl nitrite being lost within 24 hours. The formula should be studied.

2. Defatting Digitalis Tincture. A test should be developed to prove that it has been defatted. Can some other solvent which is not so inflammable be used, such as carbon tetrachloride?

3. Stability of Pharmaceutical Preparations. This should be studied from the standpoint of two factors:

a. Natural composition.
b. External influences.

4. Deterioration in Drugs Due to Enzymes. A study should be made of glucosidal drugs, with a view of preventing the action of enzymes and the deterioration in the drug during drying, storage or transportation. Drugs suggested for this study are apocynum, convallaria, adonis and chionanthus.

5. Precipitation in Pharmaceutical Galenicals. The causes and prevention should be given further study.

6. The Function and Value of Adjuncts to Menstrua. This is a subject worthy of scientific study in all pharmaceutical preparations.

7. The Extraction of Vegetable and Animal Drugs. The official methods and other methods should be compared and studied and their value determined.

8. The Effect of Hydrogen-Ion concentration upon the Stability of Tinctures, Fluidextracts and Extracts. This is a new field of investigation and seems to promise the solution of some long-standing problems. The following specific illustrations suggest the possibilities:

Tincture of Aconite. The addition of about 2 per cent of acetic acid or 0.1 per cent of hydrochloric acid is suggested. Tincture of Aconite rapidly deteriorates without such an addition.

Tincture of Digitalis. Experiments have been made with tinctures of digitalis adjusted to a variation in hydrogen-ion concentration from p_H 2 to p_H 10. Excess acidity or alkalinity result in rapid deterioration, but no deterioration within two years was noted when the tincture was neutral. As normally made tincture of digitalis is not neutral.

It is doubtful if it is actually known what preparations are stable and what preparations are unstable to-day, and under what conditions those that are unstable deteriorate and to what extent. It is not so long since it was discovered that aconite preparations were unstable, and it does not seem at all improbable that a systematic investigation of the stability of other potent pharmaceutical preparations would bring other surprises. If this investigation could be undertaken in a systematic manner by the various universities and manufacturing laboratories it would be possible before the next revision of the U. S. P. to have rather thorough and complete information on the stability of many drug extracts and the condition under which they should be stored to assure the greatest possible stability.

A tincture of the drug under examination should be prepared by the usual method of extraction and its hydrogen-ion concentration measured. It should then be adjusted by the addition of alkali and acid, respectively, to various hydrogen-ion concentrations, both above and below that naturally encountered. A portion of this material should then be placed in small containers of alkali-free glass so that the periodic examinations may be made. The earlier examinations should be fairly close together, say every three months; later, they can be extended to six-month periods and then to yearly. Preparations should preferably be kept under three conditions:

a. In cold storage.
b. At ordinary room temperature.
c. Under temperature conditions which simulate summer heat.

Another portion of the preparation should be freed from all dissolved air by washing with nitrogen under vacuum and should then be adjusted to various hydrogen-ion concentrations as above directed, bottled under nitrogen or vacuum, but otherwise stored under the several conditions described for the first portion and observed at similar intervals.

Such a study would give definite information on the effect of temperature, air or oxy-

gen and hydrogen-ion concentration on the stability of the preparation when in storage for varying periods of time. Investigations of this character already published on Tincture of Aconite and Tincture of Digitalis indicate the possibilities of such an investigation with other drugs.

9. The Preservation of U. S. P. Drugs and Preparations. Another desirable study is the influence of light upon preparations now directed to be kept in amber-colored bottles. Also the influence of oxidation, hydrolysis, acid-reaction, heat (abnormal), temperature (normal), volatility, etc., the object being to insure better preservation of medicinal preparations and greater reliability. This would be primarily a check upon the present U. S. P. directions for preservation.

The following sub-division is suggested for this study:

a. Oxidation and reduction (ferrous salts, phenols, aldehydes, etc.).
b. Hydrolysis (tannins, sugars, glucosides, acetylsalicylic acid, etc.).
c. Acid and alkaline reactions (pepsin, bismuth, glandular preparations).
d. Catalytic decomposition (H_2O_2, oils, fats, etc.).
e. Light effects (galenicals, some alkaloids, phenols).
f. Exposure effects rather than oxidation [CO_2 absorption, volatility, heat effects (normal changes, efflorescence, deliquescence, etc.)].

10. Tincture of Cantharides and Its Standardization. The extraction of cantharides is difficult, as solvents for cantharidin are few. The best solvent and methods for extraction of cantharides, its preservation and assay are deserving of further study.

11. Solution of Magnesium Citrate. It is claimed by some that the U. S. P. X solution is too acid and also too strong. The entire question should be studied with the coöperation of clinicians. This should include the influence of (*a*) acidity and (*b*) strength on precipitation; the influence of the sugar content on precipitation through hydrolysis, the composition of the crystals which separate, a comparison of various solutions of magnesium citrate from the viewpoint of palatability, permanency and physiologic action.

12. Aromatic Waters. A study of the aromatic waters is desirable from the standpoint of the amount of oil dissolved under different conditions of manufacture, and with particular reference to a definite formula for making these preparations by distillation. (See JOUR. A. PH. A., Vol. 9, p. 878 (1920)).

13. Tincture of Digitalis. It is desirable to investigate the rate of deterioration to be expected in Tincture of Digitalis when prepared by U. S. P. X formula, and also what methods may be adopted to overcome such deterioration. (See also the effect of hydrogen-ion concentration on Tincture of Digitalis, question No. 8.)

14. Ergot. The effect of menstrua on the activity of ergot preparations should be studied.

15. Fluidextract of Cimicifuga. It is suggested that this can be advantageously made with a lower alcoholic menstruum. Various alcoholic strengths should be tried.

16. Extract of Nux Vomica. A study should be made of the relative values of different acids in extracting this drug.

17. Fluidextracts. The fluidextracts of cinchona, ipecac and squill present special problems in extraction, and both menstrua and methods of extraction should be studied.

18. Resins. There is need for the further study of the standardizing and assaying of these products.

19. Tinctures of Cinchona. The two official tinctures need study from the standpoint of extraction, preservation and alkaloidal standard.

20. Extract of Cascara Sagrada. The U. S. P. X basis for standardization is too variable. Some other should be devised; the extractive should be considered and other methods tried.

21. Specific Gravity and Extractive (dry) of Non-Assayed Fluidextracts and Tinctures. It is suggested that extractives should be taken by evaporating 5 cc. of the fluid in a shallow dish until most of the alcohol and water is expelled. Then dry for 3 hours in an oven at 100° C. Report in Gm. per 100 cc.

THE U. S. P. COMMITTEE ON MISCELLANEOUS RESEARCH TOPICS.

A. G. DUMEZ, CHAIRMAN, WITH THEODORE J. BRADLEY.

1. A Study of U. S. P. Nomenclature in the Light of Recommendations from the Second Brussels Conference (1925). Those instances in which the U. S. P. X

is not in harmony with the recommendations of the Brussels Conference (1925) should be pointed out that they may be available for consideration in the next revision.

2. U. S. P. Tables. What other tables may be advantageously added to those now in the U. S. P.? If there are any to be recommended they should be prepared now and thoroughly tried in practice.

PERSONAL AND NEWS ITEMS.

Dean Frederick J. Wulling, College of Pharmacy of the University of Minnesota, is chairman of the School Committee of the Safety Bureau of Minneapolis Civic and Commerce Association. He is conducting a series of talks that have special reference to need of safety instruction to children. This work is being done by aid of radio and public lectures.

Ex-President and Mrs. Charles H. LaWall are enjoying a two months' vacation. They left on the first of the month for a trip to California by way of the Panama Canal. It has been many years since the Dean has taken a vacation and he intends to enjoy this one by disconnecting himself, as far as possible, from college and laboratory duties.

I. H. Shurtleff, member of the A. PH. A. since 1875, and, hence, a "fifty-year member," has sent in a $100.00 contribution to the Headquarters Fund and in connection with his letter expressed his appreciation of the work being carried forward.

Editor Hugo Kantrowitz is again arranging for a European trip and invitations are extended to pharmacists and friends to participate in the tour which is to take in interesting points of Germany, Austria, Switzerland and France. The departure of the tourists will be on June 30th and the return about September 1st.

Dean W. F. Gidley, University of Texas, College of Pharmacy, recently spoke before the Rotary Club of Galveston on "Present, Past and Future of the Texas College of Pharmacy."

Al Falkenhainer, of Algona, Iowa, Director of Propaganda, Campaign Committee, A. PH. A. Headquarters Building, for many years Secretary of the Iowa Pharmaceutical Association, is spending part of the winter in Texas with his family. He will soon leave for Belgium where he goes as delegate to the convention of the Rotarians.

The *Druggists' Circular* for March contains interesting sketches of the Presidents of three State pharmaceutical associations, **Clyde Eubanks,** of North Carolina; **Otto C. Kistner,** of Ohio; and **Homer C. Wallace,** of West Virginia.

Prof. Otto Raubenheimer celebrated his sixtieth birthday at his home in Brooklyn, February 4th. The *Apotheker Zeitung* gives a comprehensive sketch of the celebration in which many activities of the well-known pharmacist are briefly but interestingly referred to.

Secretary and Mrs J. G. Noh, of Pennsylvania Association, were among visitors at the office of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Treasurer and Mrs. Charles W. Holton, of the A. PH. A. helped to celebrate Mrs. Charles E. Dohme's 86th birthday; the latter enjoys good health and takes an active interest in affairs.

W. Bruce Philip, former *Chairman* of the House of Delegates, A. PH. A., and Secretary of the Alameda County Pharmaceutical Association, spoke, on January 26th, before the Kiwanis Club of Alameda. He took for his subject "Honesty in Business" and explained to the club members the purpose of the Capper-Kelly bill now pending before Congress, and the necessity of that legislation if the independent retailer, not only in the drug line but in other retail channels, is to survive. Mr. Philip found a deep interest on the part of his hearers, but a meager understanding of the bill and its objects. **Victor L. Schaefer,** Alameda druggist and President of the California Pharmaceutical Association, acted as chairman.

Members will regret to learn of the loss by fire sustained by our fellow-member **John Victor Lee,** pharmacist of Evanston, Ill., last month.

On March 1st, **R. D. Keim** addressed the members of the "Yale Men in Advertising" at the Yale Club, New York, upon the subject of price standardization as opposed to predatory price-cutting. He also spoke before the members of the New York Advertising Club, associated with the Advertising and Selling Course being conducted by that organization.

Dr. Arno Viehoever prepared an interesting pharmaceutical exhibit for the recent meeting of the American Association for the Advancement of Science, with which the AMERICAN PHARMACEUTICAL ASSOCIATION is

now affiliated. This is the first time that a pharmaceutical exhibit has been prepared for the Association and aroused considerable interest.

Editor Morris Fishbein of the *Journal of the American Medical Association* in a contribution to the March number of the *Scientific American* comments on progress in the medical and surgical field. The subjects discussed are Goat Serum for Measles, Fat Cure Fakery, Plasmochin, The New Malaria Remedy, and Calcium in the Diet.

The *Revista del Colegio Farmaceutico* continues its comprehensive review of the U. S. P. in the December and January numbers of this publication.

Dr. E. W. Nelson, Chief of the Bureau of Biological Survey of the Department of Agriculture, intends to retire early in May and will devote his entire time to the assembling of information gathered in the promotion of his work relating to biology.

A pharmacopœial congress was recently held by pharmacists of Chile at Concepcion. About two hundred pharmacists were in attendance.

Representative Kindred of New York has presented a bill in Congress which would authorize increased appropriations for the Hygienic Laboratory and proposes that the Government accept donations for use in ascertaining the cause, prevention and cure of disease affecting human bodies. An appropriation of a million dollars is asked to establish the proposed institute and $200,000 for five years to construct new and larger quarters for the Hygienic Laboratory.

Donations to the amount of $750,000 have been paid in toward Greater Temple University. The latest donation is that by Cyrus H. K. Curtis of $100.00.

The Leroy prize offered by the Society of Pharmacists of Paris has been awarded to M. Metin, for his work on "Variations of Alkaloidal Strength in *Aconitum Napellus*" and the Vigiar Prize to Mlle. Barel for her study on "The Preparation by Percolation of Some of the Extracts and Tinctures of the 'French Codex.'"

The annual dinner of Fritzsche Brothers was held at Hotel Pennsylvania, New York, on January 22nd. Employees and guests to the number of 175 were present. Vice-President Fred H. Leonhardt presided as toastmaster.

Samuel S. Dworkin contributed a comprehensive article on "The Growing Menace" to the December *Practical Druggist.* In the paper Mr. Dworkin pointed out some of the possibilities of creating sales but the message dealt chiefly with the increasing volume of sales in Chain Stores.

James F. Finneran was the guest of honor and speaker at the annual meeting of Lowell (Mass.) Retail Druggists' Association.

H. N. Bruun contributed an interesting sketch of **Julius H. Riemenschneider** to the January *Bulletin of Pharmacy.* **Bernard A. Ruegnitz,** *President* of the Iowa Pharmaceutical Association had to submit to sketches in the *Northwestern Druggists* and the *Druggists' Circular.*

Assistant Publicity Director E. S. Sater of the Pharmacy Headquarters Building Campaign Committee returned to New York this month, after a swing around the country following the Philadelphia meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION last September. Mr. Sater has given many addresses before local groups of pharmacists and student bodies in the different colleges of pharmacy of the country during the last five months. At the time of the Philadelphia meeting of the A. PH. A. the total amount subscribed to the Headquarters Building Fund was approximately $538,000. This total has now been brought up to nearly $600,000 and the cash paid in amounts to about $225,000.

Students wholeheartedly backed the project. The pharmacy students of to-day will be the pharmacists of to-morrow. Mr. Sater will continue his work in the Southeastern section of the country.

THE TWENTY-FIRST ANNUAL MEETING OF AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY.

At the 21st annual meeting of the American Druggists' Fire Insurance Co., held in Cincinnati, February 15th, it was unanimously decided to proceed immediately with the erection of the Home Office Building for the Company. It is to be a beautiful 10-story office building of modern design and located in the new center of Cincinnati at Central Parkway and Walnut St. The building is to be completed in about a year.

On January 1, 1927, the assets of the company amounted to $1,663,551.39. Its capital, surplus and reserves, above all other liabilities for the protection of the policyholders, amounted to $1,614,805.48. The insurance

written during 1926 amounted to $4,287,254.85. The insurance in force by the company amounts to $62,833,665.00. In 1926 the company was interested in 403 fire losses on which it paid $188,527.47. The amount saved by policyholders in the cost of fire insurance was $207,359.97 during the last year.

All of the directors and officers of the company were reëlected. The directors are as follows: Charles H. Avery, L. G. Heinritz, James H. Beal, Edward W. Stucky, William C. Anderson, George O. Young, J. S. Rutledge, Edward Voss, Jr., Samuel C. Davis, John D. Muir, Walter Rothwell, E. H. Thiesing, M. S. Kahn, E. B. Heimstreet and Frank H. Freericks.

The officers are: Charles H. Avery, *President;* L. G. Heinritz, *Vice-President;* Frank H. Freericks, *Secretary and General Counsel;* William P. Starkey, *Assistant Secretary;* Walter Rothwell, *Treasurer;* John H. Linnemann, *Assistant Treasurer.*

The Executive Committee of the company is composed of: Charles H. Avery, L. G. Heinritz, James H. Beal, William C. Anderson, Walter Rothwell, G. O. Young and Frank H. Freericks.

An informal dinner was given in honor of the Board of Directors and presided over by President Charles H. Avery. Talks were given by President Samuel C. Davis of the N. A. R. D.; President Otto E. Kistner of the Ohio State Pharmaceutical Association; President Edward Lehr of the O. V. D. A.; President H. J. Duesterberg of the Cincinnati Branch of the A. Ph. A.; M. N. Ford, former President of the N. A. B. P., and now President of the Ohio State Board; and Charles G. Merrell.

JOHNSON AND JOHNSON RESEARCH STUDIES WIN BOK AWARD.

Johnson and Johnson research studies have been voted the outstanding advertising survey for the year 1926.

This became known when a jury of the Harvard Business School, awarded the Edwin A. Bok prize of $2000 to Barton, Durstine & Osborn, advertising counselors for Johnson and Johnson, for "the best research studies which have reduced or prevented unwise or wasteful expenditure in a particular advertising campaign." The jury making the award was composed of prominent advertising men representing well-known advertising agencies and publishers. The announcement was made at a dinner of the Harvard Business School, given in honor of the Bok prize winners, at Cambridge, Mass., February 15th.

OBITUARY.

JAMES LITTLEJOHN TAYLOR.

J. L. Taylor, member of the American Pharmaceutical Association died in Biltmore Hospital, Asheville, N. C., January 18th, following an operation.

He was a native of Oxford, N. C., the oldest son of Mr. and Mrs. James A. Taylor, having been born in the Granville town in 1882. He was educated at the Horner Military School and during his school days he was among the leaders in his classes. When he passed the examination of the State Board of Pharmacy in April 1902, he was the youngest man in his class. His retail experience was gained in the Hancock Drug Co., of Oxford, and with the Carmichael Drug Co., of Asheville. On July 15, 1909, he entered the employ of Sharp and Dohme, of Baltimore, as salesman, and until his death he was a valued representative of the sales organization of this company.

A former friend says of him: "Never in the history of Oxford, his native town, has the passing of a young life been more genuinely regretted. Strong, handsome and gentle, he made many friends. He was recognized by all as an unusual man, his sterling characteristics being greatly esteemed. Though having lived in another town for the past twenty years, yet on his frequent visits to his parents, he was known and admired in Oxford for his sweet and gentle disposition and his unselfish and considerate deeds."

GUSTAVE HORSTMANN.

Dr. Gustave Horstmann, member of the A. Ph. A. since 1914, head of the Department of Chemistry and Assistant Dean in the College of Pharmacy at Fordham University, died February 15th, aged 58 years.

He graduated from the Philadelphia College of Pharmacy and in 1912, after the establishment of Fordham College of Pharmacy, he served as instructor of pharmaceutical chemistry and pharmacy. Later he became Assis-

tant Professor of Pharmacy and Professor of Pharmaceutical Chemistry.

Dr. Horstmann was Chairman of the Committee on Pharmacy and Queries of the New York State Pharmaceutical Association from 1921 to 1923. In 1919 he became City Pathologist of Mt. Vernon and of St. Joseph's Hospital at Yonkers. He was a member of the American Institute of Chemists, of the American Chemical Society and Secretary of the New York Academy of Pharmacy, President of West Chester County Pharmaceutical Association and founder of Fordham University Chemical Society.

REDMOND MAYO.

Redmond Mayo, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1918, and until his demise, proprietor of the pharmacy at 3500 12th St., N. E., Washington, D. C., died March 1st, of pneumonia, aged 37 years.

Mr. Mayo was born in Tarboro, N. C., where he received his early education, and thereafter, was employed in the pharmacy of E. V. Zoeller. He came to Washington as a young man and secured employment in O'Donnell's pharmacy and entered the College of Pharmacy of George Washington University. Thereafter he was employed in the pharmacy of S. L. Hilton. When the war broke out he joined the Chemical Warfare Division and served at the Research Bureau during the World War. About the time that the Armistice was signed he was recommended for a commission as Second Lieutenant. After he was mustered out, at the suggestion of S. L. Hilton, he entered business on his own account. He located well and made good. At the time of his demise he had a most flourishing business and was on the road to greater success.

He was a director of the Northeast Building Association of Washington, and a member of the Advisory Board of the Merchants' Bank and Trust Co. He is survived by his widow, Mrs. Lucy Sherwood Mayo and a three-months' old daughter.

The deceased belonged to the Masonic order and Rev. O. O. Dietz, pastor of the Brookland Baptist Church officiated at the funeral ceremonies.

Chairman of the Council, S. L. Hilton said of the deceased that the AMERICAN PHARMACEUTICAL ASSOCIATION has lost a valuable member whose efforts for pharmacy were increasing year by year.

Members of the AMERICAN PHARMACEUTICAL ASSOCIATION sympathize with Chairman E. Fullerton Cook, of the U. S. P. Committee of Revision, because of the bereavement by the death of his father and mother. The mother had been sick for a short time, the father died several weeks afterward, following a surgical operation. It is particularly sad that Mr. and Mrs. Cook should be called at a time when the son was far away from them. Both of the deceased had passed the three score and ten of years. The devotion of the members of the family for each other is a source of satisfaction to the bereaved. It is known to the members of the A. PH. A., that Professor Cook is pursuing studies under Prof. Dr. Tschirch and is accompanied by his family. They will return this summer.

Members also sympathize with Ex-President Charles H. LaWall, of the A. PH. A. and family, because of the death of his mother.

Sympathy is expressed to both of the bereaved families.

DR. IRA REMSEN.

Dr. Ira Remsen, President Emeritus of Johns Hopkins University, died March 3rd, at Santa Barbara, Cal. The deceased was born in New York, February 10, 1846. He received his A.B. degree at the College of the City of New York in 1865, his M.D. degree at the College of Physicians and Surgeons, Columbia University, two years later. He continued his University studies in Europe and received the Ph.D. degree at the University of Goettingen in 1870. Soon becoming known as a chemist and teacher of chemistry, quite a number of universities conferred honorary degrees on him for outstanding work. He was President of the American Association for the Advancement of Science in 1902 and also of the American Chemical Society, in the same year. In 1901 he was elected President of Johns Hopkins.

In 1879, Dr. Remsen started the *American Chemical Journal* which, in 1914, was consolidated with the *Journal of the American Chemical Society*. He is known to pharmacists through his textbooks and in connection with the discovery of saccharin. He stood high as a teacher and always held the esteem of his students. Dr. Remsen introduced as part of the students' training the reading of publications devoted to chemistry and a discussion of the articles appearing therein. Few men have had so great an influence in the sphere of applied chemistry.

SOCIETIES AND COLLEGES.

A. P. M. A. CONVENTION TO BE HELD AT ASHEVILLE, N. C.

The 20th Annual Meeting of the American Pharmaceutical Manufacturers Association will

Grove Park Inn.

be held at Grove Park Inn, Asheville, N. C., May 23rd–27th.

An interesting program is being arranged, and a large attendance is expected.

OFFICERS OF IOWA PHARMACEUTICAL ASSOCIATION.

Iowa Pharmaceutical Association elected the following officers for the ensuing year:

President, J. J. Gillespie, Des Moines.

Vice-President, Fred Lerch, Sioux City.

Second Vice-President, W. W. Haire, Ft. Dodge.

Third Vice-President, John Heerema, Pella.

Executive Committee, George Judisch, Denny Brann, B. A. Ruegnitz.

RESOLUTIONS OF THE MINNESOTA PHARMACEUTICAL ASSOCIATION.

Among the resolutions passed at the Minnesota Pharmaceutical Association the body endorsed the Druggists' Research plan, and it is contemplated to provide a sum for establishing a Pharmaceutical Research Fellowship under the direction of the Committee of Research. A resolution was adopted favoring the consolidation of the A. PH. A. and the National Association of Retail Druggists. Other resolutions provide that applicants for examination before the State Boards of Pharmacy be graduates of an accredited school of pharmacy; provisions are to be made for district meetings of the State Association, and that permits be required for the establishment of new stores. The Association did not deem it advisable to allow full time credit for apprentice work in hospitals under the supervision of a registered pharmacist. Provision is to be made for the reading of an educational paper by a pharmacist before each meeting or convention of physicians of Minnesota in so far as this is possible.

The Northwestern Branch of the A. PH. A. met jointly with the Scientific Section of the Association and many interesting papers were presented and discussed.

NOMINEES OF MINNESOTA PHARMACEUTICAL ASSOCIATION.

The Minnesota Pharmaceutical Association nominated the following: *President*, F. W. Moudry, Minneapolis; W. C. Muesing, New Ulm; *First Vice-President*, G. A. Thompson, St. Paul; Joseph Vadheim Tyler; *Second Vice-President*, Miss Jacobi Roes, St. Paul; Miss Margaret Keenan, Minneapolis; *Third Vice-President*, M. G. Johnson, Fulda; Theodore C. Toren, Grand Rapids; *Secretary*, Gustav Bachman, Minneapolis; Florian Ritschel, St. Paul; *Treasurer*, H. Martin Johnson, St. Paul; H. E. Brown, Benson; *Executive Committee*, A. L. Malmo, Duluth and P. H. Claydon, Red Wing.

The names of these nominees will be submitted by mail ballot, and the officers will be installed in 1928.

BALTIMORE RETAIL DRUGGISTS' ASSOCIATION.

The 11th annual banquet of the Baltimore Retail Druggists' Association was held March 3rd, at Hotel Rennert, more than 300 members and guests were in attendance. An interesting program was rendered after the members had done justice to the excellent menu.

President R. E. Lee Williamson presided as toastmaster; the banquet committee was composed of Messrs. M. Strassburger, S. Y. Harris, Wm. G. Lauer, P. J. Boenning, Chas. L. Meyer, Wm. H. Pensel and G. P. Hetz.

A large Washington delegation attended.

BUFFALO HAS VETERANS' ASSOCIATION.

Falling into step with Frater Wilhelm Bodemann, the Veteran Druggists' Association of Buffalo has been organized. The call was issued by Thomas Stoddart to meet at St. Andrew's Scottish Club where, on February 17th, a sumptuous repast and congenial good fellowship was enjoyed by the veterans. Frater Wilhelm was lauded for his activity

in stimulating the organization of the associations which promote friendship, brotherly love and sociableness. The following were elected officers:

Honorary President, Thomas Stoddart; *President*, George I. Thurston; *Vice-President*, H. J. Diamond; *Historian*, Prof. Willis G. Gregory; *Secretary*, J. S. Greey; *Recording Secretary*, James B. Mason; *Sergeant-at-Arms*, A. J. Keller.

THE OFFICERS OF THE MILWAUKEE RETAIL DRUGGISTS' ASSOCIATION.

The following officers were elected at the recent meeting of the Milwaukee Retail Druggists' Association for the ensuing year: *President*, Christ Koerner; *Vice-President*, A. A. Krygier; *Secretary*, W. F. Kaiser; *Treasurer*, L. H. Kressin; *Executive Committee*, A. E. Haise; Joseph Gaudynski, J. J. Possehl, George Butke, W. F. Kaiser, H. F. Wussow, Ernst Druschke.

OFFICERS ST. LOUIS RETAIL DRUGGISTS' ASSOCIATION.

The following officers of St. Louis Retail Druggists' Association were elected for the ensuing year: W. C. Todd, *President*; *Vice-Presidents*, J. D. La Cour and W. G. Graul; *Secretary*, S. H. W. Wortmann; *Treasurer*, George Hausgen; *Field Secretary*, E. A. Sennewald; *Directors*, F. H. Fricke, H. W. Reuter, O. J. Cloughly, H. R. Speckart and B. J. Spaeth.

OFFICERS ALLEGHANY COUNTY RETAIL DRUGGISTS' ASSOCIATION.

The Retail Druggists' Association of Pittsburgh, formerly known as the Western Pennsylvania Retail Druggists' Association, has been reorganized and renamed Alleghany County Retail Druggists' Association.

The following were elected officers: *President*, J. C. Sims; *Secretary*, J. C. Stouffer; *Chairman of Executive Committee*, L. E. Hewitt.

The Western Pennsylvania Retail Druggists' Association now comprises the following counties: Alleghany, Armstrong, Beaver, Blair, Butler, Crawford, Erie, Lawrence, Mercer and Venango. Scott Paisley of Newcastle is the *President* and J. F. Nickum of Sharon is the *Secretary*.

JEFFERSON COUNTY, ALABAMA, RETAIL DRUGGISTS' ASSOCIATION OFFICERS (BIRMINGHAM).

The following were elected officers of Jefferson County Retail Druggists' Association (Alabama), for the ensuing year: W. W. Walker, *President;* W. R. Little, *Vice-President;* Joe Duncan, *Treasurer;* J. L. M. Smith, *Executive Secretary;* Hal Duncan, *Chairman* of the Board of Directors; *Members of the Board:* Charles G. Allen, Bill Leonard, Bert Kissell, John R. Slack, Charles Gammill and H. W. Taylor.

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE STARTS NEW BUILDING.

The Board of Trustees of the Philadelphia College of Pharmacy and Science at its regular meeting on March 1st authorized the Building Committee to start immediate construction of the new college building on the site at 42nd, 43rd, Woodland and Kingessing Avenues which was acquired several years ago. The building will be three stories in the Georgian style of architecture, and will accommodate not more than eight hundred students including all regular and special classes. The Chairman of the Building Committee is **Otto W. Osterlund.** Ground was broken March 17th, and the building will be completed in about nine months. The building is to cost about $600,000.00.

THE PHARMACIST AND THE LAW.

COLLEGE GRADUATION AND RECIPROCITY CLAUSES IN THE MODERN PHARMACY LAW.

Secretary H. C. Christensen, of the National Association of Boards of Pharmacy, has submitted a form of bill for college graduation and reciprocity clauses in the model pharmacy law as revised by a Committee of the N. A. B. P., to provide for registration of former two-year graduates as well as three- and four-year graduates; minimum of one-year retail drug-store experience required; five-year exemption for those employed six months prior to date on which college graduation becomes effective:

SECTION —: Every applicant for ex-

amination and registration as a pharmacist shall be not less than twenty-one (21) years of age, of good moral character and temperate habits, a graduate of a school or college of pharmacy, or department of pharmacy of a university, recognized by the Board of Pharmacy, and shall file proof of sufficient service and experience in a retail pharmacy, under the supervision of a registered or licensed pharmacist, to make a total, together with actual time of college attendance, of at least four (4) years of pharmaceutical training and experience and shall pass an examination satisfactory to the Board of Pharmacy. Proof of the qualifications for registration prescribed in this section must be made to the satisfaction of the Board of Pharmacy, substantiated by proper affidavits or certificates. *Provided*, That in all cases the actual time of attendance at a school or college of pharmacy, or a department of pharmacy of a university, to be credited on the required four years of pharmaceutical training and experience, shall not exceed three years.

Service and experience in a retail pharmacy under the supervision of a registered or licensed pharmacist as required in this section shall be predominantly related to the selling of drugs, compounding physicians' prescriptions, preparing pharmaceutical preparations and keeping records and making reports required under the State and Federal statutes.

And Provided, That exemption from the graduate in pharmacy requirement for entrance to examination for registration as pharmacist shall be allowed to persons, who, before this Act becomes effective, have been employed for at least six (6) months in a retail pharmacy under the supervision of a registered or licensed pharmacist, and who register with the Board for such exemption within 90 days after this Act becomes effective, and who within not more than five (5) years from the date on which this Act becomes in force, produce and file evidence satisfactory to the Board of Pharmacy of having had at least four (4) years of service and experience in a retail pharmacy under the supervision of a registered or licensed pharmacist, and who prove to have acquired the requisite fitness and knowledge by passing successfully the examination required by the said Board for registration as pharmacist, within the said five (5) years; if they cannot or do not qualify by successfully passing such an examination within the said five (5) years, they shall, in keeping with public welfare, be required thereafter to become graduates of a school of pharmacy or department of pharmacy of a university, recognized by the Board, before again being permitted entrance to examination for registration as pharmacist.

Provided Further, That the Board of Pharmacy may in its discretion register as a pharmacist, without examination, any person who is duly so registered by examination in some other State, provided that the said person shall produce evidence satisfactory to the Board of having had the required secondary and professional education and training, and is possessed of good character and morals, as demanded of applicants for registration under the provisions of the Pharmacy Act of this State, *excepting* that persons of good character who have become registered as pharmacist by examination in other States prior to the time this Act becomes in force shall be required to meet only the requirements which existed in this State at the time when they became registered in such other State, and *Provided Also*, that the State in which such person is registered shall, under like conditions, grant reciprocal registration as pharmacists without examination to pharmacists duly registered by examination in this State.

THREE DRUGGISTS IN CALIFORNIA LEGISLATURE.

Thomas J. Lenehan, druggist, of San Francisco and Frank Mixter, of Exeter, are members of the California Assembly, and J. J. Crowley, San Francisco, druggist, is member of the Senate.

RESOLUTION PROVIDING FOR STATE REGULATORY POWERS OVER LIQUOR.

Representative Phillips of Pennsylvania introduced a resolution in Congress, the purpose of which is an amendment to the Constitution of the United States which would provide that Congress shall have the power to prohibit or regulate the manufacture, sale, transportation, importation and exportation of intoxicating liquors without depriving the States of any of their regulatory or prohibitionary power.

NARCOTICS ON TRAIN.

Five negro porters on Canadian trains were recently arrested in Montreal, Canada on a charge of illegal possession of narcotics. One

of them was sentenced to a year in jail and to pay a fine of $500.00. At this writing the cases of the others have not been disposed of.

CAUSTIC ACID MEASURE IS PASSED BY CONGRESS.

Without debate the House passed the Senate caustic acid bill which has been opposed by drug interests and which was thought to have little chance of enactment at this session. The bill, exactly as passed by the Senate last spring, was reported favorably by the House committee on interstate and foreign commerce on Tuesday and passed by the House March 2nd and sent to the President, who signed it.

Evidently, it was one of the bills rushed through in about a minute's time and without knowledge by many members of the House that there was opposition. The opposition from the drug trade was largely because of the inclusion of a very long list of items; for example, **Ammonia Water, Acetic Acid,** etc. The law is effective now.

EXEMPTIONS UNDER REVENUE LAWS.

A narcotic prescription calling for not more than the quantity exempted in Section 6 from the commodity tax, which is sold, distributed, given away, dispensed, or possessed as a medicine, and its disposition recorded as required by law, may be refilled.—T. D. 3766 and 3776.

It has been decided to waive the requirement that the vendor register his mail request to the Prohibition Administrator when asking for the vendor's copy of permit to purchase. Appropriate instructions have been issued waiving this registered mail requirement.

GOOD ARGUMENT FOR LEGISLATION RESTRICTING SALES OF DRUGS TO DRUG STORES.

Secretary Robert P. Fischelis has been getting out good publicity for pharmacists as well as laymen on N. J. Senate Bill No. 108, which will restrict the sale of drugs and medicines. The literature impresses the importance of such restriction for the laymen and many endorsements have been secured from the latter.

The annual Dinner and Dance of New Jersey Association was held March 9th, at Alexander Hamilton Hotel, Paterson.

Washington State Pharmaceutical Association is doing effective work with their *Special Legislative Bulletin*. All proposed laws are discussed. The following is an example of the way subjects are presented in the *Bulletin*, and refers to amendments to the pharmacy law now in the Legislature:

"1. *Senate Bill 186:* Has already passed the Senate by a vote of 33 to 0. This bill will permit the acceptance of experience as a basis for registration as a pharmacist. It is in the nature of a relief bill.

"2. *House Bill 267:* This bill proposes an amendment to the existing law relating to a clearer definition of what constitutes a drug store. It will be an aid in enforcement and will clearly set forth the type of store that must be in charge of a registered pharmacist. It is regulation within the profession and affects only pharmacists.

"3. *House Bill 241:* This is the enforcement bill of the last session redrafted. It creates a division of enforcement in the department of licenses and will compel the proper use of renewal fees which at the present time go into the general fund."

IOWA OWNERSHIP BILL.

A bill for regulating the ownership and operation of pharmacies and drug stores in Iowa, and providing penalties for violation thereof, has been introduced by Representative Grinwood; it reads:

Be It Enacted by the General Assembly of the State of Iowa:

Section 1. No person, firm, partnership, or corporation shall purchase, lease, acquire, or establish a drug store or pharmacy on or after the first day of July 1927, except:

1. A registered pharmacist in good standing;

2. A partnership, each active member of which is a registered pharmacist in good standing; or

3. A corporation, the officers of which are each registered pharmacists in good standing.

The violation of the provisions of this section shall constitute a misdemeanor and shall be punishable upon conviction by fine of not less than twenty-five dollars ($25.00), nor more than one hundred dollars ($100.00) for the first offense; and not less than fifty dollars ($50.00), nor more than two hundred dollars ($200.00) for each succeeding offense.

Section 2. The provisions of Section One (1) hereof shall not apply to any person who is not a licensed pharmacist or druggist who at the time of the taking effect of this act

owns a pharmacy or a drug store in this State; neither shall the provisions hereof apply to the surviving spouse, heirs, administrator, executor, or trustees of a deceased owner of a pharmacy or drug store who continues to operate said pharmacy or drug store.

Section 3. Publication clause. This act is deemed of immediate importance and shall take effect from and after the publication in two newspapers in accordance with the laws of Iowa.

SODA BEVERAGE BILLS.

Bills have been introduced in the Legislatures of South Carolina and Tennessee which propose a tax to be levied and collected by the retailers of 20 per cent on all soft drinks which is in effect a tax of 1 cent per glass on each sale. The retailer, by these bills, is made the tax collector for the State; he receives no remuneration and in addition thereto doubtless a loss of trade will be incurred. Such legislation as this should evidence to druggists in all States that support should be given to the State associations, so that enactments of this kind may be stopped.

STATE LEGISLATION.

In quite a number of States efforts are being made to strengthen the prerequisite laws and to pass legislation which will require college training. There are also quite a number of bills which have to do with limiting the ownership of drug stores to registered pharmacists and defining drug stores and pharmacies.

California pharmacists are endeavoring to pass the prerequisite requirement of college graduation and reciprocal registration. It is stated that the chain store interests have opposed prerequisite legislation.

A Colorado bill seeks to amend the pharmacy law by providing for a two-year college requirement and to secure additional appropriations to enable the Board to employ a permanent Secretary. There is also provision for restricting the use of the terms "drug store," "pharmacy," etc.

Delaware pharmacists are seeking to limit the registration of pharmacists to graduates in pharmacy and the ownership of drug stores to registered pharmacists.

Pharmacists of the District of Columbia are endeavoring to have the pharmacy law amended so as to provide for the college prerequisite.

Idaho pharmacists are endeavoring to secure legislation which will permit the State College to become a member of the American Association of Colleges of Pharmacy.

Indiana pharmacists desire to amend the law so as to provide for the registration of drug stores.

Iowa pharmacists are endeavoring to pass an ownership law.

Legislation in Minnesota relates to ownership of drug stores by registered pharmacists, amending the caustic acid and alkali law, allowing experience in a hospital pharmacy in lieu of drug-store experience, exempting pharmacists from obtaining an ethyl alcohol license; striking out the requirement that pharmacists must file a duplicate liquor prescription and otherwise re-drafting the present pharmacy law.

North Carolina pharmacists are supporting a bill to increase the college requirement from two years to three.

Ohio pharmacists are seeking to pass a bill requiring annual registration of all places of business where drugs are displayed or sold, to restrict the advertising of places as drug stores to those owned and conducted by registered pharmacists.

Texas is endeavoring to revise the pharmacy law and require college graduation.

Wisconsin pharmacists are supporting a bill requiring high school and college of pharmacy graduation of applicants for registration as pharmacists.

BOOK NOTICES AND REVIEWS.

Four Thousand Years of Pharmacy. An outline history of Pharmacy and the Allied Sciences, by Charles H. LaWall, Ph.M., Phar.D., Sc.D., F. R. S. A. Publishers, J. B. Lippincott Company, Philadelphia. Price $5.00.

"The long crude efforts of society
In feeble light by feeble reason led—
But gleaning, gathering still, effect of cause,
Cause of effect, in ceaseless sequence fed;
Till, slow developing the eons through,
The gibbering savage to a Darwin grew."

It is said of the late John Fiske, who wrote on both historical and philosophical subjects, that the historians generally regarded him as a better philosopher than historian, while

the philosophers considered him to be a better historian than philosopher. Although both of these qualities are not often found in the same author, they are the feature of "Four Thousand Years of Pharmacy" and the combination is a happy one.

The purpose of this book is splendidly developed, and its chronology is well handled, bringing the reader from the natural inception of the use of simples in the ancient civilizations of Egypt, Mesopotamia and Greece, into the polypharmics of the Roman and the Arabian culture and on through the medieval period of Europe with it alchemists and astrologers into the broader and systematic pharmacy and chemistry of present America and Europe. Dr. LaWall deserves much credit for this publication, which we understand has grown out of his work at the Philadelphia College of Pharmacy and Science. Not only does the work show the growth of Pharmacy through the ages, but also of the collateral sciences with their attendant philosophies.

"Four Thousand Years of Pharmacy" has come as a distinct pleasure to one who has long felt that it was the particular training that Aristotle received as a seller of drugs that developed in him those precise qualities of reasoning which made his inductive philosophy the greatest factor in the development of Western Civilization, for what else would seem to encourage an inquiring mind as much as the search to comprehend the laws of the physical world? One unconsciously recalls certain men in pharmacy during the generation just gone, who attained their pharmaceutical ability through practical experience and their application to the study of their profession. Verily the history of man is in the characterful development of the race and "Four Thousand Years of Pharmacy" appears to be a better history of philosophy than certain other publications that are more definitely titled. Every pharmacist who is interested in the evolution of his craft should read this book. JAMES E. HANCOCK.

The New German Pharmacopœia. By permission an editorial of *Journal A. M. A.* is reprinted as a review of the German Pharmacopœia, which recently became official, it follows:

"The new sixth edition of the German Pharmacopœia became official, January 1, 1927. Its green cover and heavy gold lettering are in marked contrast with the somber black covers of its five predecessors. While the new edition is of the same breadth as the fifth German Pharmacopœia, it is half an inch longer and it contains 20 per cent more pages. Unlike most German scientific works, which are printed in Roman type, this book, except for the Latin titles, is printed in heavy gothic characters, which militates against space saving.

"In respect to admissions and deletions, the revisers appear to have followed the general trend of therapeutic advance, although critical selection is far less evident than in the corresponding revision of the United States Pharmacopœia. For example, such drugs as blessed thistle, coltsfoot, basswood flowers, arnica flowers, walnut leaves, sage and violet herb are not held in much esteem by discriminating prescribers in this country, although some of them are described in our own National Formulary. Of the 106 substances added to the sixth German Pharmacopœia, twenty-five are synthetic. In marked contrast to the policies of the U. S. P. X which avoids protected names, many of the synthetics in the sixth German Pharmacopœia are trade-marked substances. These are designated by the letters E. W. (Eingetragenes Warenzeichen—registered trade-mark). Some of the additions with protected names are Airol, Albargin, Salvarsan, Pellidol, Luminal, Medinal, Atophan, Adalin, Dulcin, Eucodal, Filmaron Oil, Narcophine and Novatophan. Among other protected substances held over from the fifth German Pharmacopœia are aspirin, pyramidon, heroin hydrochloride, dionine, dermatol, novocaine, diuretin, tannalbin, collargol and alypin hydrochloride. Yeast is included for medicinal purposes, and yeast extract (killed) is admitted as a pill excipient. Several drugs are described which are but scantily employed in American medicine. Examples are arecoline hydrobromide, condurango, old tuberculin, synthetic camphor, tincture of absinth, tormentilla, tropacocaine hydrochloride and yohimbine hydrochloride. A number of substances deleted from the U. S. P. IX are included in the sixth German Pharmacopœia. Examples are bromoform, calcium hypophosphite, frangula, lithium carbonate, black pepper and trichloracetic acid. Some of the drugs newly admitted to the U. S. P. X are absent; namely carbon tetrachloride, calioben, quinidine sulphate and chaulmoogra oil. Five serums are described, the more important being diphtheria, meningococcus and tetanus. Glandular products are represented by dried thyroid and suprarenin (epinephrine U. S. P.).

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"Some of the more notable additions are listed herewith, together with the U. S. P. or 'New and Nonofficial Remedies' equivalent, if any, in parallel columns.

ADDITIONS TO SIXTH GERMAN PHARMACOPOEIA.

Ph.G. VI.	U. S. P. X.	N. N. R., 1926.
Adalin		Adalin
Agar-agar	Agar	
Airol		
Albargin		
Atophan		
Barium sulphate	Barium sulphate	
Bismuth subcarbonate	Bismuth subcarbonate	
Bromural		
Camphor, synthetic		
Chloramine	Chloramine	
Cocaine nitrate		
Colchicine	Chloramine	
Dulcin	Gluside	
Emetine hydrochloride	Emetine hydrochloride	
Eucodal		
Filmaron oil		
Glucose		
Hydrogen dioxide (30 per cent)		
Istizin		
Lobeline hydrochloride		
Luminal	Phenobarbital	
Mercury oxycyanide		Mercury oxycyanide
Methylene blue	Methylene blue	
Methyl salicylate	Methyl salicylate	
Narcophine		
Novatophan	Neocinchophen	
Oil of chenopodium	Oil of chenopodium	
Papaverine hydrochloride		Papaverine hydrochloride
Opium concentrated		Pantopon
Pellidol		
Salvarsan	Arsphenamine	
Neosalvarsan	Neoarsphenamine	
Sodium salvarsan		Sodium arsphenamine
Silver salvarsan		Silver arsphenamine
Neosilversalvarsan		
Sulpharsphenamine		Sulpharsphenamine
Sodium cacodylate	Sodium cacodylate	
Strophanthus	Strophanthus	
Potassium sulphoguaiacolate	Potassium guaiacolsulphonate	
Yohimbine hydrochloride		

"Only forty-five articles have been deleted. This differs from the last U. S. Pharmacopœia, which deleted 192 articles, for the most part in the direction of therapeutic trend and modern prescription practice. Among the deleted articles are cascara and its fluidextract. Cascara is probably the most widely prescribed drug in this country. In the sixth German Pharmacopœia, however, it is replaced by frangula. Most of the deleted articles are of minor importance.

"The book is designed for practical use by pharmacists; consequently, complicated tests and expensive apparatus are in general purposely omitted. The tests for identity and purity of substances are less numerous and more brief in the sixth German Pharmacopœia than in the U. S. P. X, and the number of preparations directed to be assayed is far less. A comparison of the assay methods in the two books reveals that the processes are generally quite similar, the differences lying chiefly in minor details. Nearly all of the alkaloidal assays are volumetric procedures, and the aliquot part system is much employed. In many of the assay processes, the use of reagent solutions in parts by weight is directed, a practice that is distasteful to American analysts. Biologic assays are entirely omitted. Digitalis is to be assayed in Government testing laboratories and sold to pharmacists under certification, the standards to be announced later. Chemical methods are given for the assay of ergot and strophanthus. The standard for ergot is at least 0.05 per cent of ergot alkaloids, and for strophanthus at least 4 per cent of anhydrous strophanthin.

"For the pharmacist, general directions and information are given concerning the preparation and storage of decoctions, infusions, mucilages, plasters, electuaries, tinctures and other classes of pharmaceuticals. Average doses, maximum daily doses and dispensing precautions are given throughout the book. The Germans do not have a book corresponding to our National Formulary; consequently there are several polyglot formulas in the sixth German Pharmacopœia which in this country would have found their way into the N. F. without cluttering up the Pharmacopœia.

"Unlike the U. S. P. X, the molecular weights and the molecular structure of many substances are given with the text, a practice that will be welcomed by analysts. Specific gravity at 15° C. (Ph.G.V) has been replaced by density at 20° C.

"Proprietary names rather than coined or descriptive names are much in evidence. Only a few instances were noted in which attempts appear to have been made to eliminate proprietary names. One instance is concentrated opium, which is apparently a substitute for pantopon. This consists of the hydrochlorides of the total alkaloids of opium and contains from 48 to 50 per cent of anhydrous morphine hydrochloride. Seven pages are devoted to the manufacture and assay of this preparation while only two are devoted to opium proper.

"Although, taken as a whole, the sixth German Pharmacopœia is probably a better working manual for the pharmacist than the U. S. P. X, it is of far less value to the analyst or control chemist and its inclusions do not as well represent the drugs considered useful by conservative medical thought—at least as medicine is practiced in this country."